Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

Journal of the Society of Arts.

FRIDAY, MARCH 4, 1859.

EXHIBITION OF 1861.

The following letters, from the Registrar-General, and from Mr. Charles M. Willich, Secretary and Actuary to the University Life Assurance Office, have been addressed to the Council:—

General Register Office, Somerset-house,
16th February, 1859.

Sir,—I beg to acknowledge the receipt of your letter of the 15th instant, and to forward herewith, in compliance with your request, a statement of the estimated population of London at the periods mentioned.

I will thank you to state to the Council of the Society of Arts, that from the length of time which has elapsed since the last Census, I consider that *very little* reliance can be placed on these estimates, as it is possible that the assumption upon which they are based may be *erroneous*.

I have the honour to be, Sir,
Your faithful servant,
GEORGE GRAHAM,
Registrar-General.

P. Le Neve Foster, Esq.,
Secretary Society of Arts, Adelphi.

Estimated population of London, within the limits adopted for the Registrar-General's tables of mortality, at the undermentioned periods:—

At the middle of the year.	Persons.
1849	2,282,900
1859	2,774,300
1861	2,885,800

Note.—These estimates are based on the assumption that the population increased during the periods between the official enumerations and the above years, at the same rate as between the censuses of 1841 and 1851. Eight years having elapsed since the last census, it is impossible to say how far this assumption is CORRECT.

Enumerated Population at the last Census, March 31st, 1851, 2,362,236.

GEORGE GRAHAM,
Registrar-General.

University Life Office, No. 24, Suffolk-street,
Pall Mall, S.W., 18th Feb., 1859.

Sir,—I have the honour to acknowledge the communication made to me on behalf of the Council of the Society of Arts, requesting my opinion "as to the probable number of young persons who," under certain assumptions, "it may be safely presumed will have grown into manhood in the years between 1851 and 1861."

I will endeavour to trace the progress of the population.

In the 10 years which will have passed from the Exhibition of 1851 to 1861:—

The survivors of the age	5	will in 1861 be	15	yrs. of age.
,,	10	,,	20	,,
,,	15	,,	25	,,
,,	20	,,	30	,,

And assuming that the population of London in 1861 will, according to the assumption made by the Registrar General, amount to 2,885,800, and if we deduct one-half* for females, 1,442,900, leaves 1,442,900 males.

In the mixed population of England and Wales, I find the per centage at the different ages was in 1851 as follows, and I am of opinion that the distribution of the population of 1861 will nearly coincide with that of 1851.

	Per cent.			
From 15 to 20	9·880	or in the Male Population of London assumed to be 1,442,900		142,558
,, 20 to 25	9·354	do.	do.	134,969
,, 25 to 30	8·170	do.	do.	117,885
	27·404			395,412
From 30 to 40	13·080	do.	do.	188,731
,, 40 to 50	9·818	do.	do.	141,664
	50·302			725,807

One-half of the population is, therefore, between the ages of 15 and 50, and able consequently to enjoy and to benefit by a renewal of the Exhibition of 1851.

It may also be observed that more than a quarter of the population† will in 1861 enter into the enjoyment of the great advantages the renewal of an Exhibition similar to 1851 will afford to them, many at that time being too young to appreciate the gain to be made by such displays.

I need not point out the vast numbers in the United Kingdom, within the limit of the above ages, who may also be improved by visits to a renewed Exhibition.

I have the honour to be, sir,
Your most obedient servant,
CHARLES M. WILLICH.

P.S.—The question has been limited to males, except *manhood* is intended to include *womanhood*. I am of opinion that the female visitors to the Exhibition will out-number the male.

To the Chairman of Council of the Society of Arts, Adelphi.

GUTTA PERCHA COMMITTEE.

Specimens of a gum resembling gutta percha have been forwarded to this Committee by the Secretary of State for India, with a request for their opinion as to its quality, and as to the probability of its becoming a valuable article of commerce. A careful series of experiments have been made upon this substance by Mr. Dugald Campbell, a member of the Committee, and a copy of his report, which was received by the Committee at their last meeting, has been forwarded to Lord Stanley.

Communications in reply to the circular issued by the Committee have been received from Malacca, through the Secretary of State for India, and from Jamaica, through the Secretary of State for the Colonies, as well as from other places.

The substance of all these documents will appear in a future number of the *Journal*.

---

*In Great Britain, at the Census of 1851, the exact per centage proportion of males to females was—

Males	48·777
Females	51·223
	100·

† (27·404)

EXAMINATIONS, 1859.—LOCAL BOARDS.

The following Local Board has been appointed since the last announcement :—

For Holmfirth.

Mr. Thomas Arkwright, Schoolmaster.
Mr. Henry Brooks, Schoolmaster.
Mr. Thomas Joshua Brook, Registrar.
Mr. John Harpin, J.P., Birk's-house, Holmfirth.
Mr. John Hixon.
Mr. John Thorpe Taylor, Woollen Manufacturer.
Mr. Joshua Moorhouse, Holmfirth, *Secretary.*

The following letter has been addressed to the Local Boards :—

Society of Arts, Manufactures, and Commerce,
Adelphi, London, W.C., 3rd March, 1859.

Sir,—I am directed to call your special attention to paragraph 9 of the Society's Examination Programme, which is as follows :—

"9.—The Previous Examinations must be held by the Local Boards sufficiently early in the year to allow the results to be communicated to the Council four weeks before the 17th May, 1859, the day fixed for the commencement of the Society's Final Examinations."

I am, Sir, your obedient servant,
P. LE NEVE FOSTER, Secretary.

EXEMPTION OF INSTITUTIONS FROM RATING.

The following petition is about to be presented to the House of Commons :—

To the Right Honourable the Commons of the United Kingdom of Great Britain and Ireland, in Parliament Assembled.

The Humble Petition of the Society for the Encouragement of Arts, Manufactures, and Commerce, Incorporated by Royal Charter,

Sheweth,

That your Petitioners several years since formed a Union of the Literary Societies and Mechanics' Institutions of the United Kingdom, and that such Union now consists of upwards of three hundred of such bodies, with which your Petitioners are in direct and constant communication.

That your Petitioners have learnt that a Bill is now before your Honourable House, by which it is proposed to repeal, amongst other statutes, the statute of the 6 and 7 Vict., c. 36, by which land and buildings occupied by Scientific and Literary Societies are exempted from the payment of County, Borough, Parochial, and other Local Rates.

That the establishment of such Societies as aforesaid has tended materially to promote the education of, as well as a taste for science, literature, and art among, the masses of the people. That such Societies are for the most part supported by funds voluntarily raised by the people themselves; and your Petitioners are confidently informed that to withdraw from these Societies such exemption as aforesaid will not only lessen their means and seriously impair their efficiency, but, in some instances, actually cause them to be closed. Your Petitioners, therefore, humbly pray that the said bill, so far as regards the repeal of the statute of the 6th and 7th Vict., c. 36, may not be passed into a law.

And your Petitioners will ever pray, &c.

(Signed)
C. WENTWORTH DILKE, Chairman of Council.
P. LE NEVE FOSTER, Secretary.

Sealed with the Corporate Seal of the Society for the Encouragement of Arts, Manufactures, and Commerce, is third day of March, 1859.

EXHIBITION OF INVENTIONS.

The Society's Eleventh Annual Exhibition of recent Inventions will be opened on Monday the 25th April next.

Persons intending to be Exhibitors should communicate with the Secretary of the Society of Arts as soon as possible, stating :—

1st. The Title of the Invention.

2nd. Whether the Article will be a Model, Drawing, or Specimen.

The Articles must be forwarded to the Society's house carriage paid. The days fixed for receiving them are Thursday the 7th, Friday the 8th, and Saturday the 9th April. No articles will be received after the last of these days.

Articles which have been included in previous Exhibitions of the Society of Arts cannot be re-admitted.

Articles should be accompanied by a short but clear description of the Invention, with a wood block (when possible) for illustration, and a reference to any publication in which the Invention is described.

All Drawings exhibited must be framed.

No charge is made for space, and the admission to the Exhibition is free.

PRIZE FOR AN ESSAY ON MARINE ALGÆ.

A Prize of £100 has been placed at the disposal of the Council, by Sir W. C. Trevelyan, Bart., to be awarded for "The best Essay on the Applications of the Marine Algæ and their products, as food or medicine for man and domestic animals, or for dyeing and other manufacturing purposes. Competitors must give the results of their original investigations on seaweeds; and they must prepare a series of specimens illustrative of the best modes of collecting, preserving, and preparing the several species. Mere compilations will not be admitted to competition."

The Essays, with accompanying specimens, must be sent to the Society of Arts by the 31st day of December, 1860. Each Essay to be marked "Essay on Marine Algæ," and to have a motto or distinctive mark attached, which mark must also be written on a sealed letter, containing the name and address of the author.

The letters containing the names and addresses of the authors will remain with the Society of Arts, and none will be opened except that bearing the motto or mark attached to the Essay to which the adjudicators award the Prize.

Copies of the conditions may be obtained on application to the Secretary of the Society of Arts.

THIRTEENTH ORDINARY MEETING.

WEDNESDAY, MARCH 2, 1859.

The Thirteenth Ordinary Meeting of the One Hundred and Fifth Session was held on Wednesday, the 2nd inst., the Very Rev. the Dean of St. Paul's in the chair.

The following candidates were balloted for and duly elected members of the Society :—

Bentley, Capt. Frederick Stocks
Lawson, Walter
Moreland, Joseph
Scorer, George Castell
Sercombe, Edwin

The Paper read was—

ON POLYCHROMY IN SCULPTURE, OR COLOURING STATUES.

BY PROFESSOR WESTMACOTT, R.A., F.R.S.

In the paper I am to have the honour to read this evening, a question of practice in sculpture will be offered for your opinion and judgment. It is not my intention to occupy your time with the history of the art, or with any of its processes; but simply to discuss what may, in some respects, be considered rather a question of taste, though other considerations of higher importance are involved in the inquiry. It is one which seems, at this time, especially to call for careful reflection, and I am glad of the opportunity afforded me by the invitation of the Chairman of your Council, to bring forward prominently before a meeting like the present, when so many persons interested in art, scholars, antiquaries, and artists, are collected together, a subject which, I venture to believe, will be found well deserving their attention.

Owing to some experiments that have recently been made, it has been much canvassed whether or not statues should be coloured.

That the judgment we may arrive at will settle definitively the practice can scarcely be expected. There always will be persons who will claim to exercise their indisputable right to please themselves, both in the mode of producing and in estimating works in those imitative arts whose first appeal is to be made through the eye. But it is important, in its relation to the public education in art, that the opinions of those who have studied its history and theory should, if possible, be ascertained respecting any remarkable innovation, or inroad upon long established practice. It is the duty of those who profess art to watch over its character and interests; and if they have reason to believe that true principles are likely to be lost sight of, or tampered with, unhesitatingly to enter their protest, in order that the non-professional, and especially the promoters and supporters of art, may not be left without information and authority to direct them.

The study of the finest productions in the highest walks of the arts of design has led to the establishment of certain fixed principles, or *canons*, upon which the judgment of ages has determined that each art can alone be safely practised. These are not accidental and arbitrary regulations; they have been fairly deduced from the most perfect known works, whose excellence may likewise be proved to result from the presence of these elementary conditions. In the imitative arts of painting and sculpture especially, the proper limits of each have been well and carefully defined. Sufficient room has been left for the exercise of individual taste and fancy; but any great or striking deviation from these conditions becomes an infringement of the conventional, yet necessary, rules by which it has been determined that each art is, or ought to be, bound.

The expression of an individual opinion, whether of approval or dissent in the matter before us, will very inadequately meet a question which should be argued much more broadly, and should include the consideration of whether it is right or wrong to *paint* statues. As a matter of taste, or rather fancy, it must be left to the artist and the purchaser; but the inquiry should be made on higher principles than if it were only to test the value of a caprice. The proposition to be discussed is, Whether the practice is conformable with the principles upon which pure sculpture should be exercised.

The grounds upon which its advocates appear to found their recommendation of this practice shall, as far as I am competent to do it, be set forth fully and fairly. So far from desiring to press my own opinions presumptuously, my object is rather to elicit argument and information; and it will be my endeavour to conduct the inquiry in a liberal spirit, and with every possible feeling of respect for those who now stand forward in support of what appears to many an unnecessary, uncalled for, and, in some respects, dangerous novelty. A difference of opinion upon particular details of practice is quite compatible with the most sincere acknowledgment of the ability and talent of those from whom we may dissent upon insulated points. The object is to establish a truth, not to achieve a victory. But if it shall be shown that the proposed innovation is not in accordance with true principles of art, it becomes the more necessary to declare it against the opinions of those whose undoubted ability may be powerful to influence the public taste in favour of an objectionable practice.

It is fair to assume that the artists who propose to introduce painting or colouring statues, &c., conceive that such additions will *improve* sculpture. It would be absurd and unjust to suppose them capable of recommending it on any other ground; with the intention, that is, of injuring or deteriorating their art. When, therefore, they profess and show they are not satisfied to see sculpture practised in its simple speciality, as an art dealing with *form* only—a sufficient difficulty—it may fairly be taken for granted that they think it is deficient in some quality wanting to its perfection, and that they are able to supply this want, by calling in the aid of another art. It is to be lamented that if this is their feeling the proposition is not thus candidly stated, and that the Polychromists do not explain more fully and clearly than they have yet done the object they have in view, and the advantages they think will accrue to their art from it, because then the question might at once be argued on its merits. But the advocates for the practice of colouring sculpture appear to be either unwilling or unable to enter upon any art-reasons for its adoption. Generally, they are satisfied with saying it was done by the ancient sculptors, and desire to found the modern practice upon precedent. It scarcely is possible to conceive that this comprehends all the reason that artists of ability can give for desiring such an innovation on long accustomed practice. To advocate colouring sculpture upon no other ground than because ancient sculptors are said to have done it, seems to be simply a narrow prejudice. Before the general body of sculptors, and the public, who are not yet prepared to carry their respect for mere antiquity quite so far, can be expected to conform to the recommendation, surely the art-reasons for such innovation, and the principles on which the "colourists" found their new theory, should be fully explained. That sculpture among the ancients, Greek as well as others, was sometimes painted or coloured, and that it had other ornamental accessories, cannot be disputed; the fact is asserted by ancient writers, and what is still more important, monuments have been found so decorated, which place the matter beyond question and contradiction. This is freely admitted, but this authority, taking it fully for what it is worth—and some remarks will be offered further on upon some of the most generally received quotations from ancient authors, on this subject—no more proves the propriety or the desirableness of the renewal of the practice in the present day, and in the actual condition of sculpture, than the equally well authenticated fact of the early personages and characters of the Greek drama having smeared their faces with wine-lees, or concealed them under hideous masks, proves the propriety of sugggesting to our actors and actresses to do likewise.

Again, admitting the fact, and even the value of the authority of antiquity for Polychromy, it still may be questioned, first, whether painting or colouring statues was originated by any of the great masters of sculpture; secondly, whether the practice was the general rule in the best period of the art; and thirdly, whether it was employed by the best artists in their ordinary works; works, that is, not executed for a particular purpose and under special conditions; a consideration, it will presently be seen, of no slight importance in this inquiry. All these questions, bearing on the ancient authority, may, it is thought, be answered in the negative.

It may be permitted here briefly to state an art-principle which cannot be disputed: it may help to clear the ground for some subsequent remarks.

The legitimate province of sculpture is to represent by *form*. What is not represented by *form* does not come under the true definition of sculpture.

Therefore, if sculpture be painted it is, of course a mixture of *two* arts; as, if a picture be relieved or raised in any part, it is also a mixture of two arts.

Let it be imagined, that in order to increase the effect of some well-known picture, say the Transfiguration, portions of it were raised and sculptured, so as to produce the real relief or projection of the various figures and groups. Would it not be denounced, first, as a most inefficient device; and, next, an inexcusable departure from an established law of art? It is much to be lamented that, while no painter of reputation, ancient or modern, has attempted so to contravene an admitted principle in his own art, professors of the sister art of sculpture, many of them artists of unquestionable talent, as Bernini, Roubiliac, and others, have not always confined their practice within such wholesome and necessary restraint. On the contrary, they have indulged in endless heterodox fancies; though it must be added that, with all their passion for the fantastic and picturesque, the sculptors alluded to are not known to have had recourse to painting their works.

Having, however, admitted the fact that there is the authority of the ancients for colouring sculpture, it is now proposed to consider more at large the question, whether it is desirable to return to this practice. The incongruity or inconsistency of mixing together two arts, which the principles essential to each require should be kept distinct, has already been shown. The next inquiry will be, what are the objects proposed to be attained by painting or colouring sculpture?

1. Is it to render the imitation more close to nature?
2. Is it to attract attention?
3. Is it to gratify the sense by adventitious decoration?
4. Is it to give distinctness to the parts of a work when viewed from a distance. All these several questions deserve our attention.

First, with respect to close imitation.

It scarcely can be necessary to state to persons of any intelligence in art, that it is a radical error to suppose that it is in the province of the painter or the sculptor to effect an exact imitation; that is, such imitation as shall produce illusion. All know that, in many respects, this is impossible in sculpture. In others, where it is possible, the *fac-simile* representation of inferior objects, such as veils, napkins, the stuffs and materials of drapery is, as all practical sculptors know, simply the work of a careful carver.

It may not be out of place to state the principle by which the sculptor is, or should be, governed in this respect. It has been stated that there are certain objects in nature which do not admit of being exactly imitated in sculpture. This is undeniable. But even if it were possible to carry the imitation of that which is the highest object of the artist's study—namely, the human figure—to such perfection as to induce the belief that it was real: that to any one entering a sculpture gallery, the figures should so closely resemble nature that, at first sight, they should appear to be living men and women standing on pedestals, would not the achievement cause a very disagreeable impression? Undoubtedly it would. At present, the lover and admirer of art is gratified by the contemplation of a fine and successful work of art, *as* a work of art. His imagination supplies all that is wanting; and he does not ask or expect that his senses shall be deceived. Nay, the moment he could bring himself to look at it as a positive and exact imitation of a human figure: the hair, the eyes, the lips, the nails—every part coloured and tinted, like life, but without life, he would be more disposed to shrink from than admire it. It is easy to imagine the feeling with which we should contemplate such well-known works as the Apollo, the group of Laocoön and his Sons, the Farnese Hercules, the Fighting or Dying Gladiator, and other admired statues so treated. Even such a near approximation to reality as is afforded by wax-work exhibitions, is anything but pleasing to the generality of people, and especially persons of taste in art, though they may be amused by the talent and ingenuity shown in thus producing resemblances. It is not intended to insult legitimate sculpture by a comparison with bad common-place wax-work figures, but, in all fairness, to take the best that could be produced. Even if they could be the productions of first-rate artists the argument would equally apply. The dissatisfaction felt in this case, is to be accounted for on a perfectly intelligible principle. The reason for it is, that wax-work approaches *too near to nature* to be agreeable as *art*, and yet it is not near enough, or true enough to nature—nor can it ever be so—to make us forget it is *art*. There is no reason to believe that true Greek sculpture of a good period ever fell so low in taste as to have a school of close imitators of the kind alluded to, or that the introduction of colour on marble statues had any such object.

As it is always desirable, if possible, to refer to existing examples, I may notice that many sculptured works are to be found in this country from which a judgment may be formed of the effect of colour in increasing the truth of imitation. I allude to the painted monumental figures still existing in many of our churches. They are chiefly of the sixteenth and seventeenth centuries, though the practice prevailed in the earliest period of such monuments. Indeed, it is a remarkable fact, that the further we go back towards *barbarism* in art, or to the infancy of art, the more surely do we meet with coloured sculpture. Now these are legitimate examples of polychromic sculpture; and, of their kind, good examples: and, what is more to the purpose, they are infinitely superior, in this respect, to any ancient works of the kind that have been discovered. Probably, as they are of modern date, no value whatever will be allowed them; but had any figures or fragments resembling them been dug up in Greece or Asia Minor, there can be little doubt, judging from the examples that have been quoted, they would have been hailed by the Polychromists as invaluable specimens of the practice, and triumphantly adduced as authority for its reintroduction. And how do these affect us considered as works of art? Are not the best of them more suggestive of the toy-shop than the sculptor's studio? Among our obligations to the committee of artists who have so carefully arranged the various courts at the Crystal Palace at Sydenham, must be noted, especially, the opportunity they have afforded the public of judging of the effect of the employment of colour in sculpture and architecture respectively. Upon its applicability to the latter art it is not necessary here to offer any remark. Polychromy in architecture has received full attention, and has been most ably discussed by many eminent writers. But where painting has been applied to insulated sculpture (for the frieze of the Parthenon must be so considered as it is here presented to us), it surely is not asserting too much to say the bad effect it produces is quite enough to insure its unqualified condemnation. The experiment here made of the light blue background only, with the *rilievi* left in raw white upon them, is sufficiently unsatisfactory; but the grey, white, black, and brown horses, and their flesh-coloured riders, with their gilded heads of hair, all so admirable and so perfect in their simple art, are here degraded into tawdry toys. It is remarkable, also, that the figures appear now to have lost their symmetry, and the composition its unity, while all the finer qualities of detail in which they abound, are entirely obscured. By far the most successful works of the kind are to be met with in Spain, where statues, as large as life, and represented in action, are to be seen painted with the utmost care and finish. It is known that while this taste prevailed, sculptors laboured to acquire also the skill of the best painters, that they might themselves execute this adventitious work, and thus insure all the pictorial effect possible to their statues. As the artists of the time, the sixteenth century, were amongst the most able that Spain has produced,—as Cano, Montanes, Hernandez—these performances far surpass anything of the kind found in other countries, and the effect they produce at first sight is described, by those who have seen them, as perfectly startling. But, while giving them all due credit for the peculiar excellence they exhibit, several accomplished writers on Spanish art have not hesitated to record their unqualified condemnation of the practice, as opposed to all true principles of sculpture. But, to show the extent to which enthusiasm, and the determination to support any favourite theory may be carried, the ingenious author of a well-known treatise on Polychromy says, "*Si une figure coloriée avec art et avec goût ne fait pas bien, c'est la sculpture qui est en défaut et non pas la polychromie.*" This is certainly taking a somewhat unusual view of the position that sculpture might be supposed to hold in the question.

In the examples referred to the gradations are studiously marked in the colours applied; complexion, half-tints, veins, the eyes—all are carefully expressed. In the very few instances in which colour has been found on ancient sculpture, there is no attempt at gradation. The pigment is of one *uniform* tint, and appears to be laid on, or over, a thin coating of *stucco*, which covers, and of course must, more or less, clog and thicken the surface of the material of which the statue is formed. Some fragments of statues were exhumed at Athens in the year 1835, on which colour was found laid on very substantially. Among them was a female figure, of which the face, the eyes, and the eyebrows, were thus coarsely loaded with thick colour. In the official report of the discovery of the sculpture at Halicarnassus, a large portion of which is now arrived in this country, it is stated that colour was found on various objects. We have no opportunity of judging of it. It has so entirely disappeared that no trace of it can be seen; unless a very few spots of red in one or two parts may be considered to represent it. In ancient works the flesh where colour is found is usually expressed by a dark red; sometimes, judging from remains of colour on some works in Terra Cotta, it was white. In figures on vases this frequently occurs.

There are, however, some examples to be noticed of more carefully coloured figures and reliefs in this material (*Terra Cotta*). They are covered, in the same manner as those referred to, with a thin coating of *gypsum* or *stucco*, upon which various tints have been laid or washed, to imitate the flesh, hair, eyes, and drapery. So far, doubtless, they must be considered authority for *polychromic* sculpture. But too much stress must not be laid upon it. It must be remembered, in the first place, that these works usually are of small size, and were probably only made for decoration or household ornament. Also, that they are not so much examples of sculpture (proper) as of plastic art. Being made of clay, and then gradually dried and baked in an oven, they underwent a considerable change of form by the irregular contraction and expansion inseparable from these processes. This, of itself, proves that the refinement of surface and delicacy of form so essential in works in marble, were not cared for in these productions, and that their being coated with an extra covering was not considered of any importance. It cannot be supposed that the great sculptors in marble would have allowed the surface of their carefully studied and highly-finished productions to be so thickened and obscured by a coating of *gypsum* or any other material of the kind, in order to fit it for the *painter* to operate upon. The very idea seems preposterous, and to carry its own refutation. A process the marble did sometimes undergo, and to which particular reference will be made by-and-bye, was quite distinct from this material interference with the integrity of the surface.

Examples are met with of statues both in marble and bronze having the eyes of various substances, sometimes of glass or paste, sometimes metal, sometimes even of precious stones; and there are instances of inlaying metal of a lighter colour, as silver, on bronze lips. It is extremely difficult to account for such a strange caprice and perversion of taste, but one thing is obvious, namely, that no resemblance to nature could have been intended here.

It has thus been briefly shown that colouring sculpture is not desirable on the ground of exact imitation, and that the Greek sculptors of the best period of the art, who are quoted as authorities for the practice, never could have had that object in view.

The next inquiry is with respect to attracting attention. They who consider that the whole and sole object of art is to please the eye, may very consistently contend that all means that can be devised as conducing to that end are legitimate. They would, therefore, add extraneous decoration or ornament to sculpture in order to attract purchasers, by exhibiting to them either what is merely pretty or showy, or something that is calculated to excite or gratify certain feelings of mere sense. There have been, and it is to be regretted there are now, artists who are open to the reproach of doing this for very unworthy purposes; but it will be admitted, to their honour, that English sculptors are not liable to the reflection of making their art a means of corruption, by the studied display of qualities and modes of expression that can only be intended to minister to the grosser senses. But, where no such purpose is contemplated, a sculptor, jealous of his fame and of the honour of his calling, should be careful not to subject himself even to the suspicion of practising what might be termed trick or claptrap, as a means of inviting attention to his merits. It is, in fact, the mere chapman's excuse; and though there may be nothing absolutely morally wrong in this, it surely places him who adopts it in a somewhat different position from the class of artists to whom we should look for the maintenance of a high character for their profession.

The next subject of inquiry, namely, whether the object of colouring sculpture was to give distinctness to the several parts of a composition, will require a more extended consideration than has been given to the previous questions. In studying the practice of sculpture among the Greeks—those great masters of the art whom all the modern schools have agreed to take as their exemplars—it must be borne in mind that, without necessarily deriving their art originally from any other nation or people, the mode of presenting it would be much influenced by foreign usage, as the practice of other and, compared with themselves, more ancient and advanced nations became known to them. The report and example of what was done in other countries, especially in Egypt and Assyria, would reach them through various channels, and, considering the vast commercial and political importance of those old-established nations, would have great influence on a comparatively new people, especially of so quick and sensitive a temperament as the Greeks, and doubtless lead to the introduction among themselves of similar practices.

It may be observed here that there can be no doubt that painting with these earlier nations was in a great measure hieratic and symbolical. In figures of mythological personages, in kings and heroes, each colour so applied (and all are painted from head to foot), conveyed a distinct meaning, probably recognised by the multitude, but certainly understood by the priests, as having a peculiar application. We do not sufficiently reflect, in considering monuments of this kind, that sculpture had a much more profound meaning, and was fulfilling a much more important mission, in past ages than it has, or perhaps ever can have, with modern nations. It was not produced merely to gratify a taste for art, or to furnish galleries with pleasing objects of exhibition and display.

As, then, the custom of painting their sculpture prevailed among the older nations, and it is reasonable to believe that the accounts of travellers may have occasioned the introduction of the practice among the more recent settlers in Greece, it may be considered rather as a foreign graft upon their own primitive attempts at art. This supposition places the practice upon an entirely different footing to that which it would have had, had it been a peculiar feature in Greek design, and originated by the great Greek masters, when of course their taste would have been made responsible for its invention. Once introduced, however, usage gave it a hold upon the prejudices of the people, who, as sculpture at that early period was, for the most part, used for sacred purposes or illustration, no doubt soon closely associated all these modes of representation with the popular religious feelings; and thus, also, in the more barbarous ages of Greek art, painting the statues of the gods became a prescribed practice.

The intuitive genius of this remarkable people soon, however, improved upon the rude decoration of the less sensitive nations around them. In their polychromic architecture they appear fully to have equalled their exemplars in the richness of emblazonment, while they surpassed them in the delicacy of the forms of their ornament, in the appropriateness of application, the balance of quantities, and the judgment displayed in the several combinations and juxtaposition of colours; and thus, by their refined taste, they raised to the dignity of fine art that which among a less-delicately organised people doubtless was mere gorgeous and barbarous enrichment. It was the same in polychromic sculpture; and in studying its existence among the Greeks at the time of their best sculptors, it will be necessary, in order to judge fairly, to inquire how much of it was prescriptive, and how far the great masters of the art can be considered responsible authority for statue-painting.

The period when it is agreed, by all historians of art, that sculpture attained its highest perfection, ranges between 480 B.C. and about 200 B.C.; from the time, that is, when Myron and Phidias lived, and when the latter superintended the more important public works undertaken by order of Pericles, till the extinction of the immediate scholars of Lysippus, fifty or sixty years after the death of Alexander the Great.

Although an approach to a fine style of art is traceable in the schools immediately preceding the age of Phidias, yet there can be no doubt that, previous to the time of that great master, sculpture was still of a hard and exaggerated character. The sculptures from the temple of the Panhellenian Jupiter at Egina, among other valuable examples, indicate both these facts. Phidias, and those under him, effected an important revolution in art. He had the genius, and his favour with Pericles gave him the power to break through much that was prescriptive and traditional in sculpture; and, freeing it from these trammels, he produced what far surpassed all that had gone before it—as indeed it never has been equalled since—in the statues and rilievi which decorated the Parthenon at Athens. Still, the reformation was only partial. Imitation was indeed now founded on the close study of selected forms in nature, expressed in what is known as the grand style in art; but there is no doubt that the improvement or the change did not extend to some important details. Those liberties and innovations which Phidias suggested and effected in the general treatment of historical and poetical subjects, would not be permitted in the same degree in the representation of sacred personages. He would here find himself restricted by usage, from which it was neither safe nor lawful to depart; and it is recorded that the mere introduction of two portraits, said to be of Pericles and of himself, in the accessorial rilievi that decorated the statue of Minerva, subjected the sculptor to an accusation of sacrilege. In statues of the gods, then, we must not always expect to find the free, untrammelled production of the artist; but even where great improvements may be traced in some important points, be prepared to see some characteristics preserved of the original types. The priesthood, always alarmed at any change indicative of the exercise of individual and independent thought, required a strict conformity to established forms. Any very sweeping innovation in the mode of representing the gods might have shaken the faith of the common people in the religion itself, and then, of course, as a necessary consequence, in its teachers and ministers. In this respect, there was policy in their insisting upon his closely adhering to certain received dogmas in art. In obedience therefore to the universal feeling, Phidias made the statues of Jupiter at Elis, and of Minerva at Athens, of various materials, and they also were coloured in parts.

It has been asserted, to strengthen the case of the Polychromists, that Phidias employed his half-brother Panænus, a painter, "to colour his statues." The sole authority for such a general conclusion is a short passage which occurs in Strabo, the 8th book, in which allusion is made to Panænus having assisted Phidias "in many things," in his statue of the Olympian Jupiter; but as we know the figure itself was of ivory and the drapery of gold, and nothing whatever is said upon the important special fact of colouring the statue itself, it seems probable that Panænus could only have been employed, as a painter, on some inferior accessories.

Moreover, we must bear in mind that the works referred to were the offerings of a grateful people for most important victories achieved over a powerful enemy who had threatened their very existence as a nation. They were to be made out of the *spoil* taken from the vanquished foe. The Minerva especially was voted to crown the triumph over the Persian hosts, after the failure of the expedition into Greece under Xerxes. The accustomed means, namely, the employment of rich and varied materials, were, of course, adopted on this occasion. Ivory and gold, painting and inlaying, and every enrichment, were lavishly bestowed in order to make these votive statues the most costly of dedicated gifts. But *chryselephantine* and *polychrome* sculpture were not first known or invented at this time, nor was Phidias the first sculptor, by many, who practised it. He merely followed in the established routine. Fortunately for art the greatest sculptor who ever lived illustrated Greece at this period; and thus it happened that the richest works in material, were also, by a happy accident, the most perfect productions of art; but surely no one would attempt to argue that they were the most perfect works of Phidias in sculpture *because* they were composed of gold, ivory, or any other particular material, or because they were painted and enriched.

It is not necessary to describe these works in detail, but it is difficult for the imagination to conceive anything more splendid and gorgeous than the effect of their varied enrichments, viewed in combination with fine architecture, the details of which were also richly coloured, and glistening under the bright sun and cloudless sky of Greece. The most poetical fancy would probably fail in attempting to picture to itself the real brilliancy of the scene, taken as a whole. But, as critics, let us not lose sight of the important fact that we are judging the works alluded to only in a large combination—as objects of *spectacle* and display. Does it follow that, considered individually, as works of sculpture, the variety of materials and the flutter of colour would not be injurious to them, as these attracted admiration, instead of its being drawn to those finer and simpler qualities which should specially claim attention in this art. The fact is, the sculpture so applied lost its distinctive or special character. It was a portion of an architectural effect. Colouring, we know, was extensively employed in architectural decoration, and when the sculptor was called upon to act in combination with the architect, his work, no doubt, was subject to the same laws of treatment as other parts of the composition. He placed his groups in the pediment with its enriched coloured mouldings against a background, sometimes painted blue—perhaps to imitate the sky, but quite as likely merely to give increased distinctness and relief to his figures. He further increased their effect, as portions of a general design, with gilding and other accessories, and, no doubt, also sometimes with colour. But in all this, his object was to make his sculpture assist the whole effect. In short, it became necessary to adapt the sculptures, in colour and in finery, to the objects around them; so that in fact, as we are now considering it, instead of a principal, it became a subordinate and only ministerial accessory.

The necessity for giving distinctness to the several parts and minor details of a work which was to be viewed from a distance, would no doubt also be considered a justifiable ground for colouring sculpture. Many objects would probably be so placed that, in their unassisted simplicity of uniform colour, they could not be judged of, nor would they under some possible conditions be sufficiently separated or detached from the architecture to be seen at all. The treatment of the frieze of the Parthenon, one of the finest examples of the class of art existing, illustrates this speculation; while the peculiar technical treatment of these bassi-rilievi shows how deeply the ancient artists studied the various requirements arising out of such circumstances in the preparation of their works. I need not speak of the peculiar flat execution of the sculpture, but will observe that the darker and decided colour of the background—for it appears on examination that even now there are remains of blue colour discernible—may be accounted for as a means for giving distinctness and relief to the horsemen and other figures in the procession. The reason for such adventitious aid to their effect will be found in the position this frieze occupied in the decoration of the temple, and, in consequence, the peculiar quality and limited quantity of light it could receive.

Now, so far as we have proceeded, the only two intelligible grounds for the introduction of colour in sculpture among the Greeks seem to be, first, to assist in giving completeness to architectural effect, and, secondly, to insure distinctness to the parts of the sculpture itself. No one will argue that in either case the object of the artist was to give to the sculpture itself something it required, or was in want of for its perfection.

It remains now to make a few remarks on the ancient written authorities for colouring (Greek) sculpture. In the first place, the presumption is very strong that the assumed fact that the finest Greek sculpture, except when it formed a part of an architectural design, was ever systematically coloured, rests on very questionable foundation. It is rather taken for granted from certain vague expressions of comparatively late writers than proved from contemporary authority, or from any experience we have of the fact as a matter of universal custom. Pliny and Pausanias and a few other writers, living long after the date of the sculptors whose works they refer to, mention some so treated; and modern critics, few or none of them practical artists, have founded various speculations upon these imperfect data. It certainly is remarkable, if the practice ever prevailed to the extent that is pretended, that, among the very large number of marble statues of a fine period of art that remain to us to attest the indisputable superiority of the ancients in sculpture (proper), there is not a single tolerable example of the practice alluded to. It will not meet the objection to say this is owing to the great age of the works, and the accidents to which they have been exposed, for many of them have been found under circumstances that have insured their integrity a sufficient time to show the original surface. Besides, there was a period when the works of the ancients were studied and imitated in Rome with the most scrupulous exactness. The chambers of the Baths of Titus and of the Villa of Hadrian have given their long-concealed and well-preserved treasures of art to the light, after preservation from injury for centuries; and while the colours of paintings on walls have been found as bright and fresh as when they were executed, none of these even comparatively late works in sculpture have been found painted, or showing any indication of colour, in the way the admirers of *polychromy* have pretended. There is no intention here to deny the mere fact that colour was sometimes employed, but only to dispute the universality of the practice, and its being usual in the best period of sculpture.

The poetical and fanciful imaginings of certain writers have no doubt been accepted by some modern commentators who have little or no practical knowledge of art, as a statement of facts, and this has led to considerable misapprehension. As artists have not always the time or opportunity to inquire or examine for themselves into the value or correctness of the statements made to them, they are often led astray by incompetent connoisseurship, and some are thus unfairly influenced to adopt, as established usages of the ancients, practices which, if they ever obtained at all, were only partial and exceptional.

A few examples of accounts of statues, improved or embellished by the authors who describe them, will illustrate the character of some of these so-called authorities, and a very little reflection will show how little such descriptions can be relied on.

A sculptor named Aristonidas is recorded by Pliny as the author of a bronze statue which represented Athamas sitting, overcome with remorse, after the murder of his son. In order to express with greater truth the effect of confusion and shame, the artist mixed iron with the bronze, and this, "by its redness shining through the bronze," caused an appearance on the surface like a *blush*. Now iron is not red, to begin with; and then the redness is described as shining through the "*nitorem*" of the bronze, as though bronze were a transparent material.

Again, another ancient authority, Plutarch, is quoted as recording that Silanio (an artist who lived about 320 B.C.) made a statue representing Jocasta dying, and that by a peculiar mixture of the metals used in the composition of this work, a cast of *paleness* was given to the countenance.

It is scarcely necessary to say that these accounts are utterly undeserving of credit—so far as they assert that those expressive tints were produced by any possible mixture of metals; for the term used is "*miscuit*," "mixed together." Any one who has the slightest acquaintance with metallurgy must know that the effects thus described are incompatible with the *fusion* of the different metals used for bronze statues: and even supposing, for the sake of argument, the possibility of keeping the metals distinct in a common melting, how then would it be possible to insure the blush or the pallor coming in the right place? It would not be easy to determine the precise colour that such materials should assume when they are intended to represent such refinements as the *complexion* of persons under the influence of strong emotions; but we have yet to learn that the addition of *red* cheeks or a *pallid* countenance would be an improvement to a *bronze* statue; and further it might be asked, would *red* be the colour of a blush in a bronze cheek? It is probable that such works as are here described, never had any existence but in the imagination of the writer. The fact of one of these authors mentioning the peculiarity of the work alluded to as an "*on dit*" rather strengthens this opinion; for Plutarch does not, as is generally assumed, describe a work he had seen, or that even existed in his time. Its reported author lived between three and four hundred years before the birth of Christ, and Plutarch not till nearly one hundred and fifty after that event, thus comprising an interval of between five and six centuries. Considerable allowance must therefore be made for those who presume to entertain doubts. "They say," or "it is said," cannot, in a practical matter like this, where there is no adequate contemporary testimony, nor any remaining monuments, be received as all-sufficient evidence or authority. In the other instance alluded to, of the statue of Athamas, Pliny says "*hoc signum extat Thebis hodierno die*," but he does not say he had seen it.

Callistratus describes, among several similar examples, a Cupid, the work of the celebrated Praxiteles. In enlarging on its claims to admiration, he says there was on his cheeks a vivid blush.

In marble statues the colour might be put on; but this, as has been been briefly shown, must have been done very coarsely and almost in patches. Pausanias mentions various works of the kind painted with vermillion. Among others he speaks of a statue of Bacchus that was made of gypsum, and painted—another of gold, or gilt, with the face painted red.

I will venture to add one more illustration from M. Quatremère de Quincy's celebrated work, in proof of the inadequacy of ancient authority, or that which is quoted as such, to establish any fixed doctrine upon this contested subject. There was a statue of a Bacchante, attributed to Scopas, who held, instead of a thyrsus, an animal (a kid) with its entrails exposed; the marble represented the livid flesh, and one sole material offered the imitation of life and death, &c.:—"*Erat autem illud capellæ simulacrum lividi coloris. Etenim saxum cadaveris quoque induerat speciem, namque et eamdem materiam in mortis et vitæ imitationem diviserat.*" The *commentator* on this passage supposes here, says M. Quatremère de Quincy, that Scopas had availed himself of a vein of marble which he found resembled the colour of the dead animal: "*Nempe in marmor incidisse artificem aliquâ parte lividum, quam partem ille cautè in effingendum capellæ mortuæ imaginem verteret.*" M. Quatremère de Quincy at once protests against this far-fetched explanation. He perceived in a moment its absurdity, or, at least, improbability, and enters into particulars to show that such an account of the wonders diplayed in this work was quite inadmissible. He truly says, "*Cette hypothèse pourrait bien n'être qu'une méprise*"—and then goes on to say, "*Il est plus simple d'imaginer*"—something else—and gives his own ingenious but quite as fanciful speculation as to how the performance was accomplished.

Now the above are some of the leading authorities upon which stress has been laid for the facts of the ancients having *habitually* coloured their sculpture. Can it be seriously proposed to establish a general practice upon such doubtful expressions and insulated examples as these, and then to call it the authority of the ancients? As reasonable would it be to take the authority of antiquity literally, and to affirm that living busts could be produced out of blocks of stone, or that bronze may be made to breathe, because we find in ancient writers such expressions as "*vivos—è marmore vultus*," or "*spirantia—æra*," or believed that pictures and statues lived, because it is said—

> "Et cum Parrhasii tabulis, signisque Myronis,
> Pheidiacum vivebat ebur—"

with endless other instances of the kind.

The descriptions of statues by Callistratus are certainly very curious and interesting. But where, in addition to the practical difficulty referred to, there is no concurrent testimony of the time, and not a single ancient fragment of a statue, such as he describes, to support his marvellous accounts of blushing *bronze* cheeks and glowing countenances, indulgence must be granted for the incredulity of those who cannot give entire faith to his statements. There is no intention to deny that the *statues* were produced by the artists to whom they are attributed. It is only suggested that the extraordinary accompaniments of *fused* colours, and the almost imperceptible gradations of delicate tints, must have been supplied by the elegant and poetical fancy of the writer.

It is necessary now to refer to one of the favourite and most frequently quoted authorities for the fact that the great sculptors of antiquity, after they had finished their works, employed artists to paint them. It has been boldly asserted that the "*circumlitio*" alluded to by Pliny, in the following passage, means painting: "Praxiteles, when he was asked which of his works in marble he valued most highly, said, 'those to which Nicias had put his hand;' so much value did he attribute to his '*circumlitio*.'" Now here is not one single expression that can be twisted into meaning painting, or colour; and certainly the passage cannot by any ingenuity be made to mean such painting or tinting with *different* colours as painting-sculptors are advocating. The great probability is that it refers to a most careful perfection of surface; both by giving a certain degree of finish or even polish to the marble, and probably by rubbing in a preparation—possibly a varnish—capable of imparting a rich roundness or appearance of fatness, so to call it (the "*morbidezza*" of the Italians), to the execution; and, anticipating by this process the mellowing effect of age. But even then such a general tone cannot be considered in the category of *colour*, as is now proposed to use it. It has been imagined by some writers that the varnish described by Vitruvius was intended to be applied over paintings and other works simply in order to preserve them.

To recapitulate in a few words. So far from denying that the ancient statues were sometimes coloured or painted, the authorities for the practice have been fairly produced and considered in this discussion. The mode of effecting the colouring has been shown, also on ancient authority. With respect to its application to productions in bronze, the marvellous effects of which have been as eloquently described, it has been shown that the authority for it is of very questionable value, and that the statements, if there be any truth at all in them, must be exaggerations. In colouring other works we now know how it was done. The description of ancient writers has been confirmed by modern discoveries; especially by the fragments that were found, as has been stated, a few years ago at Athens, painted thus coarsely, without variety or gradation of tint. Doubtless, when colour was employed on marble this was the ancient practice.

It has been objected, in reply to the arguments brought forward against statue painting, that the advocates for painting sculpture do not intend to adopt or imitate this wholesale and crude colouring, nor do they intend closely to imitate nature. It is said it is not proposed, now, to cover statues thus coarsely and entirely, but only to introduce, here and there, delicate tints, mere indications of colour in some parts; as the cheeks, the hair, the eyes (the colour of the eyes being different from the colour of the cheeks—and yet the imitation of nature not intended!). But surely this is proposing to do under the professed protection of the authority of the ancients what the ancients did not do. The advocates for colouring sculpture must in candour admit, that, whatever opinions may be entertained as to the desirableness of the practice, there is not the most remote hint in any reliable written authority, nor in any recovered fragment or work of art, to indicate that this delicate and partial tinting was the ancient practice, or was ever resorted to, even exceptionally, by any of the great masters of the art—as Myron, Phidias, Praxiteles, Alcamenes, Lysippus.

And even had it been employed, what would have become of all this tinting after the lapse of ages? Yet do we feel or fancy that the existing works of the best Greek schools, however we may deplore the mutilations consequent upon age and accident, seem to require such accessories? Do we feel that the Theseus and Ilyssus, the Venus of Milo, the Apollo of the Belvedere, and others, show a deficiency that colour could supply? Or in the modern works, do we feel any regret that the Moses of Michael-Angelo, the bronze Mercury of Giovanni di Bologna, the Christ of Thorwaldsen, the Hercules and Lycas, or the statues of the Popes by Canova, or the Michael and Satan of our own Flaxman, are without this embellishment; or believe they would be improved by receiving it? The modern sculpture-Polychromists would then introduce an entirely novel practice. They may endeavour to gain converts to a new system; but it is scarcely fair to profess they are, in this respect following in the steps of the masters of Greek sculpture. But suppose this attempt to colour sculpture should become the fashion, the delicate tinting of marble statues would necessarily act as a prohibition to the multiplication of favourite works. No sculptor who had devoted time and study to the delicate painting or colouring of his sculpture could contemplate with any degree of complacency the soaping and oiling it must undergo in order to its being moulded. Thus private collectors, galleries of art, schools of design, would be deprived of the advantage and pleasure of possessing fac-similes of possibly very fine productions in sculpture. This may be thought a trifling objection, but it is one of some importance to those who admire fine works of art, but are unable to acquire a gallery of original statues.

I have felt obliged, by the character of the arguments put forward by the advocates for painting statues, namely, the value of ancient authority, to make that the chief object of my attention. I have presumed to question its force and its universal application to sculpture (proper), though fully admitting the fact of polychromic *ornamentation*. But if its supporters should think their favourite ancient authority more distinct and decided than has been here allowed, and that the practice of colouring statues was universal and habitual among the Greeks twenty centuries ago (for the period of the greatest Greek sculptors was between five and three hundred years before Christ), is it, after all, a sufficient reason for our doing it as mere copyists? If imitations of ancient statues and ancient ideas, so far as they can be conceived independently of all ancient association or sympathies, are required, then, where it is desired, let all these presumed appliances be added; but surely it would be mere pedantry to insist upon them in the application of sculpture to the requirements of a people, of whatever civilised nation, who differ altogether in their religion, poetry, feelings, and habits from the ancient Greeks, and this only because the ancient Greeks are believed to have employed them. What hope can there be of ever succeeding in popularising art, and making it the expression of real sentiment and living thought, if we are systematically to ignore our own age and its wants, and only to put it forward mechanically, as the academic expression of factitious Greek sentiment, in such classic guise as museums and galleries of ancient sculpture suggest?

The argument that this new process might be found *pleasing* has not been openly put forth, the professed ground of its proposed introduction being always *ancient authority;* and we are, therefore, scarcely called upon to discuss that secondary question. But it may be as well to be prepared for that plea. The first inquiry in that case should be, who is to be pleased? Pleasing a particular age or party is no proof of the taste being correct. The history of art affords, or should afford, sufficient warning that fanciful innovations and caprices of practice not founded on principle, although at first they may have had admirers and patrons, have always failed to secure a permanent footing, and this even when, as has often been the case, their promoters have been artists of high reputation. What, for example, could be more pleasing in the popular acceptation than the productions and style of Giovanni di Bologna, of Bernini, and of Roubiliac? These were all men of unquestionable genius and great power in art, who, in their own time, were loaded with honours, and reaped the substantial reward of universal popularity, and left crowds of imitators behind them. It is not overrating them to assert that the best productions of these sculptors will bear comparison in invention, originality, knowledge of form, and execution, with anything the more modern schools have to show. And now, with all their indisputable merit, for no one can deny them this character, how are their works looked upon, and in what manner are they referred to?—As warnings to students not to indulge in fancies that are opposed to the principles of pure art. We have not now to learn that contemporary favour or popularity is no security for future fame; and it is remarkable how surely, sooner or later, false taste meets its fate.

A strange reason has been given by some advocates for Polychromy for the objections that have been felt here against the proposed introduction of painted or tinted sculpture: namely, that we are not accustomed to it in England. In what country, it may be asked, are they *accustomed* to it?

I hope I may be pardoned for offering, in conclusion, some few observations upon a collateral subject, which has forced itself on my attention during the inquiry into the mere art-question. It is far from unimportant; and I cannot doubt that if my apprehensions are well founded, the higher class of Polychromist sculptors, and its advocates among amateurs, will agree with me in deprecating the evils which seem to threaten art by the introduction of what is at present an almost untried experiment.

There is no surer indication of the decadence of good taste in art, and it leads to the decline and fall of art itself, than when, after a considerable degree of excellence has been attained, a passion arises for elaborate execution and ornament. What in one age is only the effect of ignorance, in another indicates corruption. The history of art, ancient and modern—for its rapid decline, even in Greece, is very remarkable—supplies us with ample evidence of this, and it is unnecessary to enlarge upon it, or to detain you while proofs are advanced in support of an indisputable fact. Barbarous and uncultivated nations in their earlier attempts at art adopt all the means that occur to coarse sensibilities to give effect to works of imitation. The employment of colour in sculpture is amongst them. In the same way, in a more advanced condition of society, when in any exercise of ingenuity or art (and it applies also to poetry and literature) a high degree of excellence has been attained, a desire of change arises; some fresh interest is anxiously looked for, and the fancy requires gratification in novel excitement. Nor is it, in art, confined to those meretricious *accessories* which have been chiefly considered in the foregoing remarks: kindred *subjects* may also be looked for as the natural consequence or development of a taste for sensuous treatment. This is a fast-growing evil in a neighbouring school of art, where sculptors of indisputable high talent are constantly putting forth works of the most objectionable character. It should be remembered, that in the period of what has been termed the sublime style of sculpture,—that of Phidias, who was distinguished as the worthy sculptor of the gods, and the beauty of whose works was said to have added something even to the dignity of religion,

> . . . Adeo majestas operis Deum æquavit,

it is believed the female form was never represented without its becoming drapery. It seems to be established that it was after his era that this fresh stimulus of the senses was introduced; and the undraped female figure has been exhibited from that time amongst the commonest subjects of imitation. The lessons of history should not be read in vain. Sculptors should strive not to allow their art to degenerate into a possible means of corruption. They must know how very few who contemplate undraped statues can have the necessary knowledge to form anything like an accurate judgment upon their merit, their truth, and the higher technical qualities of the art, and consequently, that such works can usually only address the sense, and not the understanding. They, as guardians of, and caterers to, the public taste, should avoid and protest against any innovations which, by possibility, may have a tendency to deprave that taste, or to lower the high standard of art. The class of subjects likely to be preferred for the more favourable exercise of the style of embellishment we have been considering will soon show the direction from which danger may be apprehended. The attention of sculptors will not be given to heroic representation, or to subjects that are calculated to suggest ennobling thoughts, but rather to those of an opposite tendency, the sensual class. Even assuming that the ancient classical mythology will, as usual, be the field of illustration, sculptors will scarcely choose the manly and developed forms of a Hercules, a Theseus, or an Achilles, for this delicate tinting or colouring, but will naturally prefer the soft and voluptuous female form, as Venus, Nymphs, Bacchantes, Dancing-girls; or the celebrated courtesans of antiquity, the Glyceras, the Phrynes, and Laïses of the olden time, with no stinted exhibition of their imagined charms: or if male subjects are selected, those of the class of Cupids, or young Bacchuses. Such subjects lend themselves especially to the attractive accompaniments proposed to be introduced; namely, the delicate tinting of flesh, painted cheeks and red lips, but which would appear out of place—nay, probably, even very offensive in representations of the more virile character. It is surely not too much to say that a male statue, such for instance as the Farnese Hercules, or the Barberini Faun, or even the Belvedere Apollo, if presented to public exhibition in flesh tints, with the hair painted, and the eyes coloured, however delicately and carefully this might be done, would not for a moment be tolerated. Would any father willingly take the females of his family into a gallery so peopled? It may be said, this is putting an extreme case; but the objection is a sound one, and it is not easy to define where the line is to be drawn. The feeling of prejudice which some persons entertain with respect to exhibitions of so called "classical" sculpture, and which it is impossible to blame where nude displays are made apparently only for the sake of exhibiting the naked human figure, would have ten-fold force under such circumstances. This of itself constitutes a very strong argument against these meretricious appliances to a pure and, simple art; and putting aside, for the moment, the art-question, it is difficult to conceive how the modern Polychromist, if he be a true, conscientious artist, can escape from the dilemma.

DISCUSSION.

The Chairman said, from the attention with which they had listened to the reading of the paper, he fairly concluded their full and sincere approbation of it, and their gratitude to Mr. Westmacott for having brought this subject before them. He would be glad to hear any observations upon what they had heard.

Mr. John Bell felt some diffidence in taking the initiative, and the only excuse he had for rising was that he was a sculptor as well as Professor Westmacott, and he was glad to be able to say that he entirely agreed with the observations that had been submitted to them; and he was sure all present, not only members of the profession, but all lovers of sculpture, must feel infinitely obliged to Mr. Westmacott for having placed the subject before them in so very lucid a manner. With respect to ancient art, there appeared but little foundation for supposing that the best statues were painted, and there was one remarkable instance to which Mr. Westmacott had not alluded, namely, the celebrated statue of Venus of Cnidos, by Praxiteles. He believed that was considered the most celebrated statue of ancient times. The inhabitants of the Island of Cos gave an order to Praxiteles to execute a statue of Venus. Being determined to please them, he executed two statues—one being draped, and the other not. He gave the people their choice between the two; and they selected the draped figure. The inhabitants of the neighbouring island of Cnidos took the statue which the others had not chosen, and this one became the most celebrated of the two. It was not only "the cynosure of neighbouring eyes," but people came from all parts of the world to see it. The islanders built a temple for it, open on all sides. The people of Cnidos owed a very large sum by way of tribute to Nicomedes, king of Bithynia, who was so enchanted with this statue, and wished so much to possess it, that he offered to remit the whole amount of their debt to him if they would let him have it. They, however, loved their statue so much that they preferred to keep it and pay the tribute. In every way this was regarded as the most celebrated statue of antiquity, and it appeared that it was not painted. It was executed in Parian marble. Pliny had given an account of it; but said not one word about its being coloured; both he and Lucian spoke of the charming expression of the eyes, their swimming-like character, but not a word about colouring. Mention was made of the hair, but nothing about colouring; all of which led to the conclusion that the celebrated work to which he was referring was not painted. This was surely strong negative evidence against this treatment of the statue, but there was stronger evidence than this, and that of a positive character. Lucian also spoke of the extreme beauty of the marble from which it was executed, and said moreover that on one thigh there was a stain in the marble; but, he added, that it even improved the beauty of the rest. It might be very well in those days, with a work so cherished, to fancy that an imperfection in one part could be a foil to the rest of the statue, but that would hardly be the feeling of the sculptor. Their own endeavours as artists were always to get the very best marble they could, and if a dark stain occurred they were excessively annoyed and vexed at it, and would do all in their power to do away with it. Therefore there could be very little doubt that, if Praxiteles had really been in the habit of having his statutes coloured by his friend Nicias, when that stain came out, the first thing he would have done would have been to ask him to paint it over. Therefore he considered that there was not only negative, but positive evidence that the best ancient works in sculpture were not painted; the statue to which he had alluded being considered the most celebrated of ancient times. He would not allude to any other point, as, doubtless, others present were ready to take part in the discussion. In conclusion he begged to say how much he admired Mr. Westmacott's most interesting paper.

Mr. R. J. Lane would relate a brief story in connection with this subject. An Eastern Sultan, hearing of the existence of a very beautiful human figure, executed by a distinguished artist, sent for the figure and the artist together. After due admiration had been bestowed upon this wonderful imitation of the human form, the artist was desired to put a soul into it. Upon this being communicated to him, he with all humility expressed his inability to do so. The result was an order to cut off his head, which was carried into execution.

Mr. Bell said he should have added that the statue of Venus, by Praxiteles, of which he had been speaking, no longer existed.

The Chairman would venture to offer one or two observations, more particularly with regard to the discovery of fragments of painted sculpture, to which allusion had been made by Mr. Westmacott. He apprehended the case to be this—that all the more beautiful sculptures of Greece and Asia Minor were plundered and carried off by the Romans, and that what was discovered now was found amongst the ruins of buildings, and consisted of fragments of sculpture which, as Mr. Westmacott said, formed a part of the architecture itself, and partook of the character of architectural sculpture. The fact of these being coloured was no argument that statues were painted which did not form part of the architectural decorations. He was glad that Mr. Bell (than whom no better authority existed) had directed attention to that which was a strong argument, viz., that throughout the whole of the works of Lucian, who was an excellent authority upon ancient sculpture, they found no allusion whatever to the colouring of statues. There was a passage in Plato which was the stronghold of Mr. Westmacott's antagonists, but which he had taken no notice of. He (the chairman) had considered that passage, and he did not think it meant anything more than to assert that there were certain persons in Athens whose business it was to paint statues. That there should have been persons employed to paint statues was perfectly consistent with what Mr. Westmacott had said, because they all acknowledged that statues, when they formed part of the architecture of a house, were painted. He would add one other observation on this point. There was a very poetic passage in the works of Eschylus, in which he compared Iphigenia, when about to be sacrificed, to a statue; but there was a peculiar expression to which it was difficult to give force in translation, but which, in fact, implied the want of "speculation" in the eyes, and therefore it must be inferred that the statue was not painted. The passage in the original was as follows:—

*ὀμμάτων δ' ἐν ἀχηνίαις ἔρρει πᾶσ' 'Αφροδίτα.**

PROFESSOR DONALDSON said after the strong opinions that had been expressed by sculptors, it might appear presumptuous on the part of an architect to offer opinions which seemed antagonistic to those of Professor Westmacott upon this subject. He and Mr. Westmacott were fellow students at Rome; they lived in the same house, and almost pursued the same studies, and Mr. Westmacott would no doubt pardon him if he had arrived at conclusions different to his; but as his reasoning was founded on other authorities, perhaps he might be in error and Mr. Westmacott correct. The Professor began by saying that the painting of statues was an innovation upon the rules of the art of sculpture. He (Professor Donaldson) did not understand what constituted a rule in art, for the mere practice of those who had gone before could not be considered sufficient to constitute fixed rules of art. If a certain practice prevailed among those best capable of understanding the subject, no doubt a rule might be derived from such practice; but, as they lived in an age of progress, and as year by year they were improving upon the practice of those who had gone before them, and new rules of art were introduced, he did not think that an innovation upon the old rules ought to be stigmatised as irregular or improper, but should rather be regarded as opening out new sources of enjoyment to those who loved art and its productions. It was said that sculpture was an art dealing with form only. He did not understand why sculpture should be limited to that, because, it appeared to him, if there were other accessories which gave force, and power, and expression to the productions of the sculptor, there was no reason why he should not avail himself of those accessories to give full development to his work. Let anyone go into the chapel of St. Stephen, where they found the statues of our greatest worthies represented in pure white marble. They were kept as clean and white as washing could make them. What did they represent? To him, beautiful as they were in composition and in execution, they failed to afford a vivid representation of the men of former times, to whose services the country was indebted; they seemed to him mere dead objects—inanimate corpses; because they were merely white, and even the little expression they would acquire by the accumulation of a little dirt upon them was not permitted. They had the appearance of a number of ghosts peopling that vestibule. There could be no doubt that a statue, if mellowed by age, had more charm in it than when it came fresh from the sculptor's studio. It was then white, cold, and repulsive, but time gave it a certain degree of warmth, which was, in fact, colour, and therefore he felt that a sculptor producing a fine work of art in white marble, was producing an inanimate corpse—a dead and repulsive object as to the subject and the material; whereas, if he gave it some colouring, some animation by means of colour, it would address itself more effectually to the imagination. It was stated that because colouring in deep red had been found amongst ancient sculpture, that therefore vermillion was used invariably in this coarse manner. That did not necessarily follow, because where painting was applied, it was only reasonable to suppose that it was employed with a due regard to discretion and the tone of the work to be embellished. It was not to be supposed that these artists would go beyond what they found in nature itself, where all was so harmonious and beautiful. Let them go to the Greeks, who, it was admitted, painted their sculpture under certain conditions connected with architecture. It would be acknowledged that they were a people of the highest sensibilities. The professor had used the term sensuous, which was quite proper, as not meaning to imply the sensual and animal, but rather rising to the intellectual, and these refined people were not insensible of the improvement which sculpture admitted of by a certain degree of colouring. Then, again, look at the Greeks in their poetry. The chairman knew that in their poetry they were sensibly alive to all the delicacies of the measure of their words, their metres, and every other elegance which gave it power and beauty. Then look at their music. They carried the gradations of tone to a much greater degree than we possessed in modern music. In their architecture, too, they did not admit a straight line, both horizontal and vertical lines being slightly curved. If, therefore, in their poetry, in their music, and in their architecture they were thus guided by the highest sentiments of the beautiful, might we not also assume that if they painted their statues they did it with good reason, and not with the idea of merely captivating the senses of the beholder, but rather to satisfy those who required the highest development of art. Professor Westmacott had alluded to the descriptions of sculpture given by old writers, but it should be borne in mind that these writers described the impression upon their minds of what the works were, rather than the actual works themselves. Mention was made of a sculptor who produced a very fine work in bronze, and it was added that iron was mixed with the bronze to produce a certain effect upon the complexion. They must recollect that in the description quoted they had the words of Pliny and not the words of the artist. He (Professor Donaldson) did not possess sufficient chemical or metallurgical knowledge to be able to say whether the effect would be as stated, but oxyde of iron might have been introduced with the bronze to give a richer tone to it, and so far the artist might have been right in giving it what was now called a Florentine tone. All that Pliny could know of the matter was that there was a certain sentiment or expression about the work which had been conveyed to his own mind, whilst the artist himself might only have intended to impart a more beautiful tone to the metal. They might study the annals of every age up to the most recent times, and they would find that always and in all countries there had been a feeling in favour of

---

* Æsch: Agamem: l. 418.

Polychromy in art. The sculpture of the Egyptians was painted, as was evidenced by the sphynxes, which, though formed of granite, basalt, and other beautiful materials, were covered with a coating of colour to produce a greater impression upon the minds of the beholders. If they went to the Greeks, they found their buildings and architectural statuary coloured with the same object. In every part he had visited, he found evidences that colouring had been employed even upon the most beautiful marble; and here let him remark, that the beauty of the material of which the statue was made was no evidence against the application of colouring. He very much regretted that the attempts of Mr. Owen Jones to illustrate the polychromy of sculpture at the Crystal Palace had failed, which, as stated by Mr. Jones himself, was owing to the plaster of Paris not being susceptible of that lustre of colouring which could be imparted to the marble, and, therefore, he (Mr. Jones) had made up his mind to have a statue executed in marble upon which to try the effect of the colouring, when, instead of the dulness exhibited by the plaster casts, there would be a degree of transparency and brilliancy, which, he believed, would justify the admirers of Polychromy in the views they held. Going to the mediæval period, they found that all the sculpture was painted. There was hardly a statue or group of that period which had not been coloured. Mr. Westmacott might say that was done to satisfy a craving for effect, but surely it was not probable that the greatest artists of the finest periods of art would degrade themselves by pandering to vulgar taste, in order to produce effect by any means whatever. Therefore, when they looked to those great periods of art and found that even the finest sculpture was painted, they were justified in assuming that a painted statue was a legitimate work of art. It was suggested that the painting might have been only partial painting; but that would be impossible. They knew that architectural statues must be painted wholly and altogether; because, if that was not the case, when they considered the high embellishment of the buildings, if a statue had been only partially painted it would destroy that harmony, and tone, and vastness of effect which were required. Therefore he said the advocates of polychromy in sculpture did not go upon a vague idea, but had some valid reasons for advocating the use of colour. It was contended that, inasmuch as they saw wax figures painted, it was a low style of art to attempt to colour sculpture. There was no fair ground for assuming that, because the panderers to vulgar taste had adopted this means of producing an inferior effect, therefore the true artist should not avail himself of the like means to produce a good effect. It was the object of the sculptor to adhere as closely as possible to nature, and to produce those impressions upon the mind which the living object itself would have produced. Why then should the sculptor disregard that colouring which was an essential part of every living object? Why should they disapprove of the expression given by colouring the eyes, the hair, and the garments, and prefer to produce an inanimate representation in a block of white marble? It was not to be assumed that colour should be employed in an exaggerated manner, but with a due regard to legitimate art. He recollected that Mr. Gibson produced a statue of Lady Beauchamp, with which the family were extremely well satisfied, and which was acknowledged to be a fine likeness. Mr. Gibson afterwards procured the permission of the family to colour that statue, and the result was that, whereas it was formerly a representation of the dead corpse of a person still living, the colouring gave animation and expression, in fact, a soul which it did not possess before. He submitted that every means in the power of the artist should be employed to make a statue as nearly as possible to resemble the person whom it was intended to represent, and this, he maintained, was effected by the use of colour.

Mr. J. G. **Crace** entirely agreed with all that had been said by the last speaker. Those who had given the matter candid consideration would acknowledge that, where it had been carefully and well done, colour allied to form was a vast improvement. He thought they were too much attached to the beauty of the material of which statues were made, and on this account they discountenanced altogether the application of another art by which those statues might be much improved. Professor Westmacott had started with an admission that the art of painting had been applied to sculpture in ancient times, and then went on to argue that there were evidences to show that this had never been done with the best works. He had stated that there were men in Athens celebrated for their talent in painting statues, and immediately afterwards asserted that no statue of any repute had ever been painted. He would ask the gentlemen who had spoken in condemnation of the application of colour to form, whether they had ever seen it applied. He had had opportunities of seeing it applied in mediæval works, and he had never seen an instance in which he had not felt convinced that it was a great improvement. With reference to a remark that had fallen from the chairman, he thought if he reflected upon the observation he had made with regard to the "eyes" it would lead to an opposite conclusion to that which he had drawn. In reference to its application to architecture, they had abundant proofs that colouring was so applied, and yet how few were the examples that could be produced. Upon a statue that had been buried in the ground, it was almost impossible that any colour could remain. As to the mode of application, he contended that it should not be applied to a material such as marble in a way that could destroy its texture, and if this evil were avoided, he maintained that the sister art of painting could be brought to bear upon the improvement of sculpture. As regarded the ornamentation of the Parthenon, he was happy to hear Professor Donaldson state that Mr. Owen Jones attributed the failure of his attempts to reproduce this to the nature of the material alone, which did not admit of the transparency and lustre which would have been the result of the application of colour to marble. The back-ground should have been massive, in order to throw out the forms, and none of those forms should have had a colour put upon them more positive than that of the back-ground. It was to throw out the forms, to give clearness and distinctness to them that colour was introduced, and in the case of the frieze of the Parthenon, by no other means could those forms have been realised without the application of colour. With reference to mediæval works, it was patent to all that not only were they coloured, but vastly improved thereby. He might mention those great statues in the nave of Cologne cathedral, which were the admiration of all who beheld them.

The **Chairman** then proposed a vote of thanks to Professor Westmacott for his paper. The vote of thanks having been passed,

Professor **Westmacott** sincerely thanked them for the manner in which his paper had been received. He had not expected that everybody who had listened to him would agree with all he had said; but he was glad to have this opportunity to ventilate the subject. He had been much gratified at hearing the remarks of his old friend Professor Donaldson, but, at the same time, would have preferred hearing him upon his own art; because he had, as yet, heard no argument which had shaken any of his (Mr. Westmacott's) statements. He had considered all the different points upon which those who had spoken had tried to meet him, and he still felt that the grand principle which he had enunciated was the true one. One gentleman had said that he had brought forward the fact that the ancients painted their statues, and then argued that they did not paint them. He never heard so unfair a conclusion drawn from premises. He would let any candid reader of his paper judge whether or not this was a just conclusion. It was not his province on the present occasion to enter into the question of taste—as to whether people should gild or paint their houses, their statues, or even their faces, but he would say he believed if the practice of colouring sculpture prevailed, all the evils he had anticipated would result from that practice. Sculpture was, after all, an art of *form;* it was no use playing with words, they could make it nothing else. It was either form or not form. They, doubtless, all admired the works of the great painters, but when mere daubs appeared upon a marble statue it was an insult to art to call that painting. He thanked them extremely for their flattering attention to his paper. He was was not at all offended by any disagreement with his own views on the subject, for he was sure that discussions like this elicited truth, and that was all he wanted.

The Secretary announced that, on Wednesday next, the 9th inst., a paper by Mr. William Hawes, Member of the Council, "On the Cape Colony, its Products and Resources," would be read. On this evening William Ewart, Esq., M.P., will preside.

THE FIRST ENGLISHMAN WHO EVER SAW A GALVANO-ELECTRIC TELEGRAPH.

Dr. Hamel, of the Imperial Academy of Sciences at St. Petersburg (and the oldest corresponding member of the Society of Arts in London), has communicated to the Academy some results of his researches relative to the first development of galvanic and electro-magnetic telegraphy. Among other interesting facts, he shows that the youngest of Lady Palmerston's three brothers was the very first Englishman who ever saw a galvanic telegraph. It was the Russian Baron Schilling who, at Munich, so long ago as 1816, had invited the Honourable Frederick James Lamb, then British Envoy and Minister Plenipotentiary to the Court of Bavaria, to accompany him to Dr. Samuel Soemmerring, in order that he might see his telegraph, the first ever made to act by a galvanic battery. Schilling having introduced the British Minister to Soemmerring on the 2nd of July of the year mentioned (1816), repeated the visit with him ten days later, the 12th of July, when the telegraph was made to operate before them. Besides the brother of Lady Palmerston and the Russian Baron Schilling, there were on that occasion present also the Countess Banfy, Schilling's sister, and her husband, Count Banfy, from Vienna, then on a visit at Munich. Dr. Hamel proves that the date of Soemmerring's invention is nowhere accurately stated. His first telegraphic apparatus was made between the 9th July and 6th August, 1809. Baron Schilling, who was at that time attached to the Russian mission at Munich, saw it for the first time on the 13th August, 1810, and from that day he became an enthusiastic labourer in the field of electric telegraphy. In the autumn of 1812, he was enabled, by means of a subaqueous conductor, planned by him, in April and May, at Munich, to explode powder mines across the river Neva, near St. Petersburg. Subsequently, he made the very first electro-magnetic telegraph, a copy of which, in 1836, found its way through Bonn and Heidelberg to London. In 1837, there was at St. Petersburg a submarine cable making for him, with which he intended to unite Cronstadt with the capital, through the Finnish Gulf. His death, which took place on the 7th August, prevented the execution of this early submarine telegraph enterprise. Dr. Hamel remarks, that the Honourable F. J. Lamb, afterwards Lord Beauvale, who married in 1841, at Vienna, where he was more than ten years ambassador, the daughter of the Prussian minister there, Count Maltzahn, and who, in 1848, succeeded his elder brother, the second Viscount Melbourne, so well known as having been long Prime Minister of England, and after whom, in 1837, the present capital of the auriferous colony Victoria in Australia, was named, did not live to see the telegraph introduced there. He died on the 29th of January, 1853. About that time two gentlemen from Montreal, in Canada, Mr. Butcher and Mr. McGowan, left for Melbourne, in Australia, to establish from thence electro-telegraphic lines in various directions. The first, to Williamstown, was opened on the 3rd March, 1854, in the presence of the then Lieutenant-Governor Latrobe. Since last November, the capitals of the colonies New South Wales and South Australia (Sydney and Adelaide) are both telegraphically united with Melbourne in Victoria. Ere long the continent of the distant fifth part of the globe (Australia) will, through Bass's Strait, be electro-telegraphically united with Tasmania, by means of a submarine cable lately made at Mr. Henley's factory, at Enderby Wharf, near Greenwich.

ADAMS'S SYSTEM OF PERMANENT WAY.

In the *Journal** for the 12th of November last was an account of this invention. It is interesting to note the progress which has been made in its adoption. The result of the trial on the North London had been conclusive as to experiment, and the further result in the Eastern Counties, on the main Cambridge line, at a spot "where the ballast was run out and without drainage," purposely chosen, has been satisfactory in point of economy, giving a sound, firm, and elastic road. It has now been specified for several new lines in Great Britain; and the engineer of the Bombay and Baroda Railway has specified it for the remaining portions of his line, under the sanction of Lord Stanley and the Indian Council, after a close examination by their own engineering authorities, Sir Proby Cautley and others.

The following is extracted from the reports of the engineer of the Bombay and Baroda line:—

"Longitudinal Sleepers.

"We owe to the enterprise of the authorities of the Eastern Counties and North London Railways the proof that the first class of permanent way can be laid down on longitudinal timber sleepers, of half the width required for cross-sleepers, and of any convenient length, thus bringing the weight of the sleeper within that which any native Indian labourer could carry on his shoulder. Twelve months' experience of this system, under as heavy and trying a traffic as any in England, justifies its adoption in India, where there can be no doubt that it will enable the native timber to furnish all the sleepers that can be required for railways, and thereby diminish the amount of our freights from England to the extent of 161 tons per mile of line in the one article of timber sleepers.

"Nor is this the limit of the advantage which the system would confer. It enables us to dispense entirely with the objectionable cast-iron chairs and their fastenings. It ensures, by the smaller scantling of the timber, a more perfect impregnation with creosote when necessary. It gets rid of the wood keys, which I am informed by undoubted authority are found in practice most inconvenient and perilous from the impossibility of keeping them permanently fastened in their places in the Indian climate. It admits of the process of reversing the double-headed rail when the upper table becomes worn, and this doubles the life of the rail by avoiding the injuries inflicted by the use of the chair. It gives considerably increased strength to resist oblique and horizontal forces. It will give sleepers admitting of being effectually packed with ballast under their entire nominal bearing surface, as contrasted with the old cross-sleepers, which only admit of effectual packing for about two-thirds of their length. It gives the rails an uniform bearing on the sleepers in their entire length, instead of being supported at points with 2 feet 6 inches to 3 feet intervals, and makes a much more easy road as regards the movement of trains.

"Finally, it reduces the cost of construction as compared with the cross-sleeper road, by over £930 per mile, which on our 164 miles between Surat and Bombay, just undertaken for construction, would produce a gross saving to the Company of about £153,000."

---

* Vol. VI., page 717.

* * * * * * * * * * *

"I have now fulfilled my duty in bringing before the Board and the Government the consideration of this important subject. It is for them to decide whether an improved principle of railway construction may be introduced upon our line that shall give us a much better road, with a saving of £930 per mile in the first cost, and a gross saving of £153,000 on the 164 miles between Surat and Bombay—that shall adapt itself to the existing requirements of trade and navigation between Great Britain and India—that shall reduce enormously the cumbrous contingencies attending the enterprise in which we are engaged, and, in the ratio of such reduction, increase the facility and rapidity of its execution,—finally, that shall enable us to complete the above-mentioned 164 miles, with the limited tonnage of 37,000 tons of materials supplied from England, instead of 72,000 tons.

"An early decision on the subject is much to be desired, as it will be of great importance to the progress of the works, that the contracts for permanent way for the sanctioned 117 miles between Surat and the Veturnee River should be made with the least possible delay.".

In the appendix to Colonel Kennedy's report are letters from Mr. H. Martin, the Engineer-in-Chief of the North London Railway; Mr. Robert Sinclair, the Engineer-in-Chief of the Eastern Counties Railway; and Mr. John T. Burke, the Engineer-in-Chief of the Tenby and Pembroke, and of the Cowes and Newport Railways, stating their favourable experience of the system, and their intention to adopt it on the several lines with which they are connected.

What is good for India is good for our other colonies, and, in fact, for all countries to which the appliances of permanent way are imported, unless to countries where timber is so scarce as to induce pilferers to steal it for the sake of fuel. In such cases it is probable that the substitution of longitudinal angle irons instead of timber, bolted to the rails laterally, may prove the most desirable. It has been ascertained that from nine to ten inches continuous width of bearing under each rail, where the rail is sufficiently deep to prevent mischievous deflection, is ample for very heavy traffic; and, as this only involves the use of 4½ angle iron, instead of the greater widths used in the first trials, the first cost is, in fact, reduced below that of the ordinary cross sleeper road.

BREAD BY MACHINERY.

Machinery for the making of bread has lately been introduced into this country by Mr. Miller, a baker in Upper George-street, Edgware-road, who also adopts some modifications of the usual process of preparing the dough. The machinery comprises a mixing machine, a kneading machine, and a machine for forming the loaves. The mixing machine consists of an iron cylinder, through which a horizontal axis passes, having a series of beaters, or blunt knives, fixed at right angles to it. Each knife or beater is bent round, in the form of an oblong parallelogram, which extends from the axis to within a short distance of the inner surface of the cylinder. The cylinder is stedfast, while the axis carrying the beaters revolves inside. The materials for making the bread are placed inside the cylinder, and in a very short time, by the action of the machine, they are thoroughly mixed. The kneading is performed by passing masses of the mixed material, after it has stood a sufficient time, through a pair of steel rollers several times, and thus it becomes kneaded and thoroughly amalgamated into a uniform dough, suited for passing into the next machine, which forms it into loaves. This machine consists of a sloping platform, which delivers the dough into a pair of steel rollers working horizontally at the end of it, capable of adjustment to any suitable distance. Beneath those rollers revolves an endless web, which, by means of a simple mechanical arrangement is carried step by step the exact space required for the cutter, which stamps out the loaves from the dough in succession, as it is carried along the web in a thin uniform sheet. The pieces of dough thus cut, which are not more than three-quarters of an inch thick, are set side by side on flat tins, and placed in a warm atmosphere for about thirty or forty minutes, until the dough has risen somewhat, when they are put in the oven. The modified process for making the bread is as follows:—

The dough after it has been mixed and kneaded in the usual way for making bread, is kept in fermentation for about six hours or more, until it has reached the acetous state, and become unfit for use in the ordinary process, when there is added to it one-fifth of its weight of dry fresh flour, and without any additional water it is mixed and broken rapidly and very thoroughly through rollers, cut and pierced in a cutting machine, or by other means, and after a slight fermentation in an uncovered state exposed freely to the air, say, for thirty to forty minutes, according to the temperature of the room, to raise it, baked it in a quick oven, which should be ventilated by an open door or other means of admitting and discharging the air freely. In making the dough, about ninety-five pounds of water to two hundred pounds of flour are used, and from this weight there result usually two hundred and eighty-two pounds of baked bread. The invention is applicable in making bread from any kind of flour of which bread may be made, and is said to produce the same beneficial result in the use of all kinds.

The inventors do not confine themselves to the precise details above described, as such may be varified or modified without departing from the principle of action thereof; but they claim as new, the process of allowing the dough to ferment till it passes into the acetous state, then reviving it by working and breaking it into fresh dry unfermented flour, aterwards cutting and piercing it, and raising it while exposed freely to the air, and baking in an open or freely ventilated oven.

The mixing cylinder in use at Mr. Miller's is sufficiently large to take half a sack of flour at a time. The whole of the machinery is driven by a small steam engine of two-horse power.

The machinery and process generally are American inventions, and form the subject of patents in that country as well as in this.

Home Correspondence.

ELECTRO-PLATING ENGRAVED COPPER-PLATES.

Sir,—In a letter upon "Electro-plating engraved copper-plates," inserted in your last number, the author says, "It is a tolerably well-known fact amongst those conversant with electro-metallurgy as applied to printing purposes, that engraved copper-plates have since many years been coated with silver and gold, for the purpose of protecting the plates from wear while being printed." Will Mr. Bradbury state any instances, for the information of those who, like myself, are unacquainted with the fact?

I am, &c.,
GEORGE T. DOO.

Great Stanmore, March 1st, 1859.

Sir,—The considerable amount of copper-plate engraving annually done in this country, renders it a matter of general interest that any new improvement in the means used, tending to obtain good printing in very large numbers, should be fairly brought out before the public, and I thought I had sufficiently fulfilled this duty when I last year introduced the valuable process of "acierage of engraved plates." That some attempts at imitation of the process should already have been made, is not to be wondered at, considering the practical value of the invention; and in a letter from Mr. Henry Bradbury, in your last number, in order to screen himself from imitation, he brings forward a counter-charge against me of having copied others, on the startling assumption that "it is a well-known fact that gold and silver have been for many years used for coating plates to protect them from wear while being printed."

This is contrary to facts, and all the printers with whom I have acquaintance, after being consulted, will bear testimony that Mr. Bradbury is in a complete error; that there was a great desideratum for some means of protecting engraved copper-plates from wearing away as they do while at printing, and that the principal houses in London, Messrs. McQueen, Messrs. Brookes, and others hailed with great satisfaction the introduction of my process.

That other metals, besides gold, silver, iron, and zinc, should be capable also of yielding deposits in a manner so as to render them useful for printing purposes, is nothing new to me, and it is of course open to any one to try them; but I believe that, as I have stated elsewhere, the metal I am using will be found the most desirable, and the most serviceable, as it is doubtless the cheapest and most abundant; and as to cost, the notion, as advanced by Mr. Bradbury, of being able to deposit palladium at two pence and platina at one penny per square inch is simply an hallucination worthy of the assertion by the same person, of being able to print off 2,000 good impressions from a zinc deposit; besides, the extreme difficulty of removing the coating of platina from the surface of an engraved copper-plate would be a serious bar to using that metal with any degree of safety.

Before retiring from this controversy, into which I have been forced, much against my habits and my wish, I shall only briefly say that, being taunted by Mr. Bradbury with what he is pleased to call my acquired process, I readily acknowledge that I have acquired it by the most legitimate and fair means.

I am, &c.,
F. JOUBERT.

Porchester-terrace, March 1st, 1859.

MR. CHESTER'S PAPER ON THE EXAMINATIONS.

SIR,—Deeply interested in the subject of Mr. Chester's valuable paper, read before the Society on the 16th Feb., I listened with great attention to the discussion that followed, and much regretted to find that the time of the meeting had expired before the subject had elicited all the valuable remarks which I feel confident would have followed in a more extended discussion. There were a few remarks of a practical nature I wished to have made, if an opportunity had occurred; and, with your permission, I will now present them in the *Journal.*

I cannot subscribe to the proposition of Sir Thomas Phillips, that, give what chances you may to men in general, there are but very few of them will succeed or ascend in the social scale. This proposition is directly opposed to my own observations; and after many years' close and attentive investigation, I am convinced that, with equal chances, there are but few men who would not succeed equally with the most fortunate; and I firmly believe that there have been many George Stephensons who have passed through life unnoticed and unknown, by which the world has been a very great loser.

I cannot agree with Sir W. Page Wood that Mechanics' Institutions have been failures, although I am fully aware that in many instances they have not accomplished all that was expected from them; neither can I agree with Lord John Russell, that Mechanics' Institutions were introduced twenty years too soon or in advance of the times.

My own convictions on that subject, which are very strong, are the result of having been one of the earliest associates of the late Drs. Birkbeck, Gilchrist, Fellows, the present Lord Brougham, and others, in the inauguration of that important instrument of education, then, for the first time, presented to the mechanics of London, not as a mere speculative theory, but as the result of twenty years' previous successful experience of the Glasgow Mechanics' Institution, which had been founded by Dr. Birkbeck, as he often beautifully, and in his own peculiarly powerful manner, told us, from his observations of the anxious desire of working mechanics to understand the uses and application of the machines they were employed to construct.

That Mechanics' Institutions diffused such useful practical knowledge among the working classes to a very large extent, is a fact that cannot now be ignored, for many living proofs exist in persons who have advanced in social position entirely from the knowledge they gained in the classes of the Mechanics' Institutions; and therefore, had society waited twenty years longer for such a step in the path of education, it is not at all clear how it would have been better able to apply and appreciate such advantages.

Mechanics' and other analogous Institutions have not failed in their objects, which have been substantially realised. They may not have succeeded to the extent hoped or expected from them, but such shortcomings must be looked for from other influences, and may, I submit, be found among those commercial calculations of success that would estimate the sum that would induce a man to throw himself into a river or suspend himself from a tree, or, which is about as consistent, tempt him to immure himself in the bowels of a mine or the intestines of a sewer, for all the waking hours of his natural life. The fact is that Mechanics' Institutions have been eminently successful in the spread of useful practical knowledge, but they have not been made self-supporting, and, consequently, they have from time to time been drawn out of their proper course by the variations in feelings and opinions of those upon whom they have been dependent for support. The progress of such institutions has also been much influenced by the altered circumstances and locations of their members, very many of whom have been compelled to remove their homes beyond the influence of such institutions.

There is one remark of Lord John Russell's that I am sorry to say my own observation obliges me to confirm to some extent, but I do know many exceptions; that the highly-paid, skilled workman frequently abuses the advantage of his position, but in such cases I think it will be found, upon investigation, that such persons have not received any part of their education in Mechanics' Institutions.

That the means of general useful education exist already to a greater extent than is accepted by those most interested in such acquirements is much to be regretted; but we must not jump to the conclusion that because greater numbers do not avail themselves of the means within their reach that they are indifferent or culpably neglectful. In reference to the means of education, I think I may with confidence refer to the operation of our own parochial schools, and without comment take my parish (Clerkenwell), and say that the always requiring in my business one or more boys from the age of about thirteen to fifteen, has, in the course of many years, given me a large experience, and it has been with me a general custom to take such boys from one or other of the schools in the parish, without regard to sect; and now, after the practice of many years, I have much pleasure in stating that from such sources I never had one bad boy; all that I can trace have done well; some have remained in my own establishment twenty or thirty years, in the discharge of duties requiring the strictest integrity, as they are wholly employed in working the precious metals. Others have sought and found most successfully a still higher position; and among such there at the moment occurs to me the career of three of them, one of whom is now at the head of a very old and highly respectable wholesale firm in London; another is holding and discharging with the highest satisfaction an important public situation in Hong-Kong; and the third is now on his passage home to his native country, a retiring South-American merchant, having realised an ample fortune.

This view of the subject is pleasing to contemplate, but it unfortunately has its reverse, which, although painful, is no less important to investigate, and I have gained some insight into the operation of such melancholy causes and effects, by lately requiring a boy when there were not any in our schools ready for employment—in consequence of which I made my want public and in a very short time I had fourteen applications from boys, some of them appearing sharp, intelligent lads; but, to my great surprise, I found that in the fourteen there were eleven who could not read or write—a fact which led me to investigate the cause of such lamentable ignorance; and, although the reports of so many cases would be long and monotonous, I may briefly sum them up by stating that I found eight out of the eleven were the sons of widows who were left with families of three to seven children, without any means for their support but what they could obtain from the premature labours of their children, who, consequently, could not be spared for the advantages of the school, otherwise within their reach, while their parents all appeared most anxious for the welfare of their children. Here is a difficulty in the path of philanthropic exertion to ameliorate the condition and prospects of a large number of the working-classes in the community, which it appears to me cannot be overcome without providing for those so necessitated the means of useful remunerative employment, so that they may be enabled out of their own industry to emancipate themselves not only from the evils of general poverty, but from those that press with the greater weight, because they too frequently burst suddenly on comparative prosperity, from some one or other of the numerous sources of affliction from which very few families are wholly exempt. This view I know involves the discussion of another question, but it is no less a very serious difficulty in the way of the great education question, taken up with so much zeal and perseverance by the Society of Arts. I am, &c.,

E. NASH.

30, Coppice-row, Clerkenwell, 19th Feb., 1859.

BOOKS AND LIBRARIES.

Sir,—Permit me to offer a few remarks in connection with Mr. Leighton's interesting paper on Books and Libraries.

On the subject of the changes which occur in paper by age, and the destruction of books by insects, it would be extremely desirable to have a more accurate investigation of the various effects supposed to originate in damp, and the best modes of preventing the pernicious results; and I would venture to suggest that some of your members and correspondents residing in India and other warm climates could furnish valuable assistance in this respect, by examining into and reporting upon the condition of printed books and written documents, both paper and parchment, parchments which may have been deposited for a lengthened period in those hot regions.

The inquiry should be conducted with special reference to the two-fold method of sizing paper—the gelatine or English mode, and the vegetable or continental system. Which suffers most, and whether in the same form, by mildew or insects? May not the circumstance of the Chinese paper being generally sized with a solution of starch, account in some measure for the paper being a ready prey to insects, as stated by Mr. Leighton? Is it the fibre of the paper or the size which is the primary attraction, and the cause of the deplorable ravages of these hosts of tiny enemies?

I believe the only provision hitherto made against decay (decomposition of the size) and insect attack in warm climates is to well alum the size; I may observe, however, as bearing on this point, that the late Professor Cowper informed me that by adding a little corrosive sublimate to the paper pulp which he occasionally used in the illustration of some of his lectures, he effectually preserved it from "mothering" for an indefinite period.

An illustrated edition of Campbell's poems in my possession is quite spoiled, as if by iron-mould, but the spots appear to result from the development of fungi rather than from the presence of any metallic substance. Almost every spot has its echo on the opposite page, so that it is difficult to say which originated the other. The spawn appears to have found suitable nutriment in the sizing matter of the opposite page in contact, and so spread until, by some accidental change to a drier situation, the growth was stopped. Has any observer carefully noted spots of this description under a microscope?

The improvements of science have their accompanying disadvantages. Gas itself, the creation of modern chemistry, is the greatest enemy of our books in large towns; and it must also undoubtedly be admitted that some of the chemical preparations employed to impart to paper the brilliant purity of colour so much demanded by the trade and the public, are of only temporary value; and, being themselves affected by the slow action of the atmosphere, leave the paper of an unexpected and undesirable sallow hue.

Few things are more disagreeable to a careful reader than a torn map or illustration in a book; this disfigurement may be obviated by the illustration or map being so arranged as to occupy the space of two pages, being mounted by the central divisional line on a guard in binding, thus opening and shutting as a double page when referred to, and never projecting beyond the other leaves of the book. This is much better than placing maps in pockets. It is always objected to by printers and binders on account of the extra trouble, but a little quiet persistence generally induces a change of opinion, and the "cannot be done" of yesterday becomes the "much better" plan of to-day. In the Society of Arts' library instances of the success of this system are not wanting; and it is seldom that book illustrations or maps require to exceed the space of two pages of the letter-press.

In a private library, glass-cases, and even curtains are an abomination to an earnest reader. Books are for use, and the more easily accessible the better for those who have little time; open shelves, with leather falls, a shelf being devoted to each subject, are to my mind the best compromise between utility and preservation, and the simplest mode of arrangement; and, inasmuch as, in addition to the necessary variety of dimensions of books, the tastes of authors and publishers preclude our arranging the volumes on each subject in regiments and in the uniforms suggested by Mr. Leighton, "Green for Botany, &c.," some degree of uniformity in variety may nevertheless be obtained by placing all the books on any one subject upon its allotted shelf; first, according to their size, thus gratifying our idea of order, and next according to the colours of the binding, keeping the greens together, and so on; even the various tints may be arranged so as to be grateful to the eye.

A small amount of trouble in this matter will frequently make a great change for the better in the aspect of even a small library.

For books purchased one by one, and well studied, an affection springs up which subsequent change in the binding can only impair; the very diversity of the bindings gives a pleasant individuality to books; and the "whole" binding of a book to which we have been previously accustomed in a less perfect form, is often like elevating an active commoner to the peerage —our friend becomes silent, the sympathy is diminished.

A word or two on margins:—I would not follow the example of Mr. Leighton's friend, and cut down all the margins to the print, nor do I approve of excessive underlinings, such as those of an old Scotch friend of mine, who, to intensify the effect of a letter he had written, began by underlining the whole with black ink lines, then added a few extra dashes under important words; a further supply of lines in red ink increased his emphasis, and, to crown the whole, one or two words were favoured with a fourth underlining.

If we agree with our author, no long expression of approval is necessary; and if we disagree, there is seldom room in the margin to argue the point at full length.

Further, at the time of reading we may not have a convenient opportunity for jotting down observations; we may be in a coach, or in a railway train, or walking, or the ship may be pitching heavily. Moreover it interferes with the course of the reading; and, if accomplished, on opening the book at a subsequent period the notes may not be at hand. The following is a simple plan of making notes, which remain ever and always present when the book is opened, recalling the points which most attracted attention when the volume was the subject of study. A small circle in the margin denotes a great thought or a happy expression, deserving to be remembered quite apart from the particular subject of the work; a square indicates a clear statement of the author's views; a triangle shows that on the lines opposite the mark will be found some knotty point not understood, or some statement upon which the reader differs in opinion, or a matter requiring investigation.

By these simple indications, requiring only the possession of a pencil, we converse with our author, and admire, approve, or dissent, as the case may be, without interrupting the course of our reading; and when the volume is finished, these points may be scheduled, and notes and extracts made at leisure; and, on turning over a book in after years, the impressions of its first reading are revived, and the character of its contents brought back to the memory.

I had hoped to have heard from Mr. Leighton some useful suggestions with respect to the library of the Society, and, not to prolong this already lengthy letter, would merely throw out a few hints on this subject.

The library is hardly *au courant* to the Society's other operations, and cannot be considered a model. I believe it is innocent of a correct catalogue. The books are much crowded, and the cases dispersed throughout the building. No part of the Society's funds is appropriated to the purchase of new works; and I presume the library is only enriched by donations or exchange of "Transactions" with other Societies.

The Society's operations are now so multifarious that this important matter seems almost entirely overlooked. Although the Society possesses many valuable works, they are but little available for study, on account of the want of space and accommodation.

The British Museum being so near, perhaps it may be thought unnecessary to devote much attention to our library as one of reference. Would it not, therefore, be advisable, in order to increase its usefulness, to organize a system of circulation, as has been done in the case of the library of the Corporation of the City of London, which is now conducted in the following manner:—

The books are divided into two classes.

1st. Modern, and such as can be easily replaced.—These are allowed to be circulated amongst the members of the Common Council and readers introduced by them.

2nd. Scarce Works.—These are not permitted to be removed from the library, but are always readily accessible on application to the courteous librarian.

Hoping that among these desultory thoughts may be found the germs of suggestive matter to some of your readers, I am, &c.,

W. STONES.

PRODUCTS OF THE COMBUSTION OF COAL-GAS.

Sir,—In the discussion of Mr. Leighton's paper at the Society of Arts, on Wednesday last, a letter was read from Dr. Letheby, alleging that the bindings of books, &c., were destroyed by the action of oil of vitriol produced during the combustion of coal-gas.

In consequence of Dr. Letheby having made a similar statement to the Commissioners of Sewers of London, in the year 1854, the directors of the Chartered Gas Company applied to Dr. Leeson and Mr. Warrington for their opinion, and the following extracts from their report will show that the fears entertained by Dr. Letheby are without foundation.

After expressing their regret that Dr. Letheby has not given the details and *modus operandi* of the experiments he made, they go on to say that "Without for one moment doubting the intentional accuracy of Dr. Letheby's statements," they believe that the oil of vitriol "has been *manufactured* from the gas; not produced by the ordinary method of combustion, but by a peculiar process adopted for these experiments;" and they "have reason to doubt, in the absence of any specific evidence to the contrary, whether all the acid produced was actually sulphuric acid." Their report proceeds as follows:—

"To show the actual contamination of the air of an apartment in which gas is burnt, the air itself ought to be analysed, and we should then probably find that any sulphuric acid generated by the ordinary combustion of the gas has been neutralised by the ammonia frequently contained in it, by the lime or carbonate of lime present in the whitewash or plaster of the ceilings and walls of an apartment, as well as by other combinations. The absence of any such experiment removes from a reflecting mind confidence in these deductions; and then supposing, which is difficult, that free sulphuric acid* (oil of vitriol), which requires a temperature approaching a red heat (620° of Fahrenheit), or rather above the melting point of lead, to sustain it in the vaporous condition, could exist in the atmosphere of an apartment. If its per centage in the air had been shown by experiment, the public would probably have smiled at its infinitesimal proportion, instead of being alarmed at the fearful amount of 15 grains of *oil of vitriol* from every 100 cubic feet of gas.

* * * * * *

"Again, we are told that these conclusions are borne out by experiments made at the Athenæum and elsewhere years ago, by chemists whose accuracy and talent we would not for a moment question; but it must be remembered that these experiments were made at a period when the methods of purifying gas were far less efficient than those at present employed, and the results simply show, what can be well imagined, that the atmosphere of rooms, constructed without any ventilation, like an inverted bell-glass, to receive and contain not only the various products from the combustion of either candles or numerous gas-burners, but also the exhalations, dust, and heat of a crowded apartment, was certain to prove injurious to a material like the leather used for binding books, which, from its peculiar constitution, is very subject to decay, and when exposed to a heated and vitiated air soon becomes friable and rotten; this decay has been observed in many old libraries long before the use of gas was known.

"As to the amount of sulphur actually existing in combination with the gas from which this "oil of vitriol" has been manufactured, it is manifest that the experiments have been far too limited in number to determine anything like an accurate average of the sulphur contained in the various gases consumed in this metropolis, and we have reason to believe that the experiments referred to were made at a period when, from an unprecedented combination of circumstances, the gas companies were obliged, for a short period, to resort to an inferior description of coal, containing much sulphuret of iron, the gas from which required a larger amount of purifying power than had been provided for this unforeseen emergency. This want was speedily remedied, and there is but little chance of the recurrence of any similar disaster."

---

* When in the concentrated form, which renders Dr. Letheby's statements so fearfully appalling.

The report goes on to argue that if so large a quantity of vitriolic acid is produced in the combustion of coal-gas, the amount which passes into the atmosphere from the coal used in the ordinary fires in London must be so enormous as to be seriously injurious to health. The rate of mortality, however, they argue, proves that this cannot be the case. The report proceeds as follows:—

"Here, then, it may be well to consider whether part of this improved condition as to health be not attributable in some degree to the action of the sulphurous acid, not 'oil of vitriol,' which is continually passing off from our coal fires, uniting with and destroying many of the fœtid animal and ammoniacal exhalations from the crowded poor and the sweating labourer? It is even admitted in this report [by Dr. Letheby], after having created sufficient alarm by the terms 'oil of vitriol' and 'vitriolic acid,' that a '*large portion* of this dangerous compound would doubtless be NEUTRALIZED by the AMMONIA of the gas and by that of DECOMPOSING ANIMAL SUBSTANCES. If a *large portion* of the minute quantity of sulphur-compounds at times contained in coal gas are admitted thus to unite with these *really poisonous exhalations*, and thus neutralise their baneful effects, it is but rational to conclude that the sulphurous acid, whether from our coal fires or our gas, is performing an important function in disinfecting the atmosphere of this densely crowded city of much of its poisonous and putrescent miasm.

"But is this *large portion*, which is thus admitted to *unite* and *be neutralized*, estimated, and deducted in the report from the whole quantity? On the contrary, Dr. Letheby's report proceeds thus:—'Much would remain in a free state, and *be the source of incalculable mischief*:' how or in what way this *incalculable* mischief is to arise, we are not informed."

I beg also to call your attention to a report made by Dr. Faraday, some years since, to the Committee of the Athenæum Club, of which the following is an extract:—

"*Question.*—Is either sulphurous or sulphuric acid formed by the combustion of coal gas in the ordinary way? *Answer.*—A little sulphurous or sulphuric acid is generally formed from the combustion of coal-gas. If well purified gas be used, this product is *rarely sensible;* it is less sensible as sulphuric than as sulphurous acid thrown into the room. I think little of it."

The following extract from a paper by Mr. Lewis Thompson, on this subject, is very conclusive:—

"No mortal man ever did or ever can obtain 21 grains of oil of vitriol from (I will not say 100 cubic feet of gas, but) from the combustion of 100,000 cubic feet of any coal-gas supplied to the public within 20 miles of St. Paul's Cathedral. The substance really obtained is not oil of vitriol at all, but sulphate of ammonia, and upon this I most unhesitatingly pledge my character as a chemist. Oil of vitriol is a highly corrosive liquid, whereas sulphate of ammonia is a harmless solid."

I could quote also the opinions of other eminent chemists who distinctly state the impossibility of forming oil of vitriol during the combustion of coal-gas in the ordinary way; but I trust I have shown sufficient evidence to allay any alarm that may have been produced by the reading of Dr. Letheby's letter.

I am, &c.,
F. J. EVANS.

Gas Works, Horseferry-road,
March 2nd, 1859.

MEETINGS FOR THE ENSUING WEEK.

Mon. ......Royal Inst., 2. General Monthly Meeting.
London Inst., 7. Rev. Henry Christmas, "On Shakspeare's Historical Dramas."
Medical, 7. Anniversary Election.
Entomological, 8.
British Architects, 8.
United Service Inst., 8¼. Capt. Fishbourne, R.N., "On the Effect of the Introduction of Rifled Cannon on Naval Architecture."

Tues. ......Royal Inst. 3. Professor Owen, "On Fossil Mammals."
Medical, 5. Anniversary Oration.
Syro-Egyptian, 7½. Rev. Dr. Hewlett, "On the Geology of the Valley of the Nile."
Civil Engineers, 8. Discussion on Mr. Mallet's Paper on the Co-efficients of Elasticity and Rupture in Wrought Iron;" and, if time permits, Mr. T. F. Chappi, "An Account of Experiments upon Elliptical Cast Iron Arches."
Medical and Chirurg., 8.
Zoological, 9.

Wed. ......Literary Fund, 2. Anniversary.
United Service Inst., 3. Rev. W. Ellis, "On Madagascar and its Inhabitants."
London Inst., 3. Mr. E. W. Brayley, "On Meteorology."
Society of Arts, 8. Mr. William Hawes, "On the Cape Colony, its Products and Resources."
Geological, 8. I. Mr. J. Y. Tayler, "On the Veins of Tin Ore at Evigtok, Greenland." II. The Hon. C. A. Murray, "On some Minerals from near Tabriz, Persia." III. Mr. J. W. Kirkley, "On the Permian Chitonidæ of Durham."
Graphic, 8.
Archæological Assoc., 8½.

Thurs. ...Royal Inst., 3. Prof. Tyndall, "On the Force of Gravity."
Royal Soc. Club, 6.
London Inst., 7. Prof. Bentley, "On Vegetable Substances used for the Food of Man."
Antiquaries, 8.
Philological, 8.
Royal, 8½.

Fri.........United Service Inst., 3. Admiral Fitzroy, "On Meteorology."
Astronomical, 8.
Royal Inst., 8. Meeting, 9. Dr. W. Odling, "On Magnesium, Calcium, Lithium, and their Congeners."

Sat. ......London Inst., 3. Mr. Thomas A. Malone, "On the Metallic Elements, and their Principal Salts and Alloys."
Royal Inst., 3. Dr. W. A. Miller, "On Organic Chemistry."
Royal Botanic, 3¾.

PARLIAMENTARY REPORTS.

◆

SESSIONAL PRINTED PAPERS.

Par. No.

Delivered during the Vacation 1858.

500. Magistrates' Clerks Fees—Return.
68 (XI). Trade and Navigation Accounts (30th Nov. 1858).
98 (A H). Poor Rates and Pauperism—Return (A).
461 (I). Colonization and Settlement (India)—Index to the Four Reports.
455. Public Income and Expenditure (1856-7 and 1857-8)—Return.
98 (A XI). Poor Rates and Pauperism—Return (A).
230. Poor Relief—Returns.
248. Bill—Equitable Councils of Conciliation.
Army (Promotion and Retirement in the Higher Ranks)—Report of Commissioners.
Births, Deaths, and Marriages in England—19th Report of the Registrar-General.
Statistical Tables relating to Foreign Countries—Part 5.
East Indies (Mutinies)—Further Papers (No. 8).
Manufactures and Commerce—Reports of Her Majesty's Secretaries of Embassy and Legation.
Trade and Navigation (1857)—Annual Statement.
East Indies (Mutinies)—Further Papers (No. 8A).
Colonial and other Possessions—Statistical Tables, Part 3.
Public General Acts—Cap. 21—110, and Table.

Delivered on 4th February, 1859.

Guano—Correspondence with the Agents of the Peruvian Government.

Delivered on 5th and 7th February, 1859.

2. Property and Income Tax—Amended Return.
3. Property Tax and Population.

4. Bill—Occasional Forms of Prayer—
Russia (Commerce and Navigation)—Treaty.
Brazil (Settlement of Outstanding Claims)—Convention.
Moldavia and Wallachia (Organization of Principalities)—Convention.

Delivered on 8th February, 1859.

25. Metropolitan Improvements—Statement of Advances out of the Consolidated Fund.
20. Metropolitan Main Drainage—Copy of Letter.

Delivered on 9th February, 1859.

1. Public Income and Expenditure (Balance Sheet)—Account.
83. General Committee of Elections—Mr. Speaker's Warrant.

Delivered on 10th February, 1859.

9. Registration of Voters (Scotland)—Return.
21. Tax Collectors—Return.
30. Navy (Pensions)—Return.
35. East India (Loan)—Returns.
East Indies (Mutinies)—Further Papers, No. 9.

Delivered on 11th February, 1859.

6. Railway and Canal Bills—Report from the Board of Trade.
34. East India (Revenues)—Return.
2. Bills—Superannuations.
4. ,, Highways.
10. ,, Endowed Schools.
11. ,, Sale of Poisons.
13. ,, Church Rates Abolition.
14. ,, Church Rates Commutation.

Delivered on 12th and 14th February, 1859.

8. Roads (Scotland)—Return.
12. Poor Relief—Returns.
14. Superintendent Registrars—Return.
29. Episcopal and Capitular Property (Metropolis)—Return.
37. Bank of England—Annual Accounts.
38. ,, ,, Copy of Applications for Advances to Government.
22. Naval Receipt and Expenditure—Account.
43. Navy (Excess of Expenditure for the year 1857-8)—Statement.
44. Post Office Department (Packet Service)—Estimate.
42. Navy—Estimates.
9. Bills—Tramways (Ireland).
15. ,, Elections, &c.
16. ,, Municipal Election.
Tariffe—Return.
Commissariat Department—Royal Warrant and Report of the Committee.

Delivered on 15th February, 1859.

7. Houses, &c. (Boroughs)—Return.
8. Ecclesiastical Commission (Ireland)—Annual Report.
49. Treasury Appointments—Copy of Treasury Minute.
32. Oxford University (Pembroke College)—Copy of an Ordinance
39. East India (Civil Service)—Regulations.
3. Bills—Manor Courts (Ireland).
5. ,, Markets (Ireland).
7. ,, Lunatic Poor (Ireland).
18. ,, Ecclesiastical Commission.

Delivered on 16th February, 1859.

40. East India (India Office)—Copy of an Order in Council.
45. Colonels—Supplemental Return.
46. Army—Copy of General Circular.
8. Bills—Receivers in Chancery (Ireland)—Abolition, &c.
12. ,, Marriage Law Amendment.
19. ,, Title to Landed Estates.
20. ,, Registry of Landed Estates.
16. College of Advocates (Doctors' Commons)—Return.
24. Session Clerks—Return.
28. Hocquard *v.* The Queen, ship "Newport"—Return.
36. Divine Service (Army)—Return.
55. East India (Finance)—Copy of Despatch, &c.
66. ,, ,, (Loan)—Subscriptions.

Delivered on 18th February, 1859.

63. Army Estimates.
50. Local Acts (1, Falmouth Docks and Harbour—2, Fishguard Harbour Improvement—3, Kirkwall Harbour—4, Cork Harbour Reclamation—5, Dartmouth and Torbay Railway—6, Findhorn Railway—7, Formantine and Buchan Railway—8, Hereford and Brecon Railway—9, Holyhead and Bangor Railway—10, Belfast and Londonderry Junction Railway—11, Cleveland Railway—12, Waveney Valley Railway—13, Chichester Harbour Embankment—14, Portsmouth New Docks and Railway)—Admiralty Reports.
6. Bills—Sale and Transfer of Land (Ireland).

Delivered on 19th and 21st February, 1859.

31. Queen Anne's Bounty—Account.
34. East India (Finances)—Copy of Dispatch and Review of Finances
57. ,, ,, (Transport of Troops, &c.)—Returns.
58. Public Income and Expenditure (31 March, 1858, to 31 December, 1858)—Return.
66. Shipping—Return.
67. Post Office (Compulsory Prepayment)—Return.
68. Trade and Navigation Accounts (31 December, 1858).
20. Stage Carriages, &c.—Returns.
59. Mint—Account.
65. Navy—Returns.
17. Bills—County Prisons (Ireland).
21. ,, Piers and Harbours.
23. ,, Real Estate Intestacy.
25. ,, Juries (Ireland).
26. ,, Edinburgh, &c. (Annuity Tax).
28. ,, Medical Act (1858) Amendment.
29. ,, Lunatics (Care and Treatment).
30. ,, Lunatic Asylum, &c.
31. ,, Burial Places.
32. ,, Sale of Grain, &c.
Guano—Correspondence.

Delivered on 22nd February, 1859.

5. Duchy of Cornwall—Account.
10. Burial Grounds (Metropolis)—Returns.
13. Sanitary Improvements (Metropolis)—Returns.
41. Flogging (Navy)—Return.
52. Bankrupts' Certificates—Return.

Delivered on 23rd February, 1859.

23. Woods, Forests, and Land Revenues—Abstract Accounts.
69. East India—Extracts from Financial Letters.
70. ,, ,, (Home Treasury)—Estimates of Receipts and Disbursments.
76. Greek Loan—Account.
77. Public Debt—Account.
78. Russian Dutch Loan—Account.
79. Sardinian Loan—Account.
80. Harbour, &c., Bills (Wear Navigation and Sunderland Docks, and Sunderland Dock Capital)—Board of Trade Report.
27. Bills—Newspapers, &c.
34. ,, Inclosure.
35. ,, Local Assessments, Exempton Abolition.
36. ,, Poor Law Boards (Payment of Debts).
Manning the Navy—Report of the Commissioners.

Delivered on 24th February, 1859.

15. False Weights and Measures—Return.
71. Army Commissions—Return.
75. Bullion—Return.
24. Bill—Registration of County Voters (Scotland).

Delivered on 25th February, 1859.

48. Metropolitan Police—Accounts.
64. Customs Department (Port of London)—Return.

PATENT LAW AMENDMENT ACT.

◆

APPLICATIONS FOR PATENTS AND PROTECTION ALLOWED.

[*From Gazette, February* 25, 1859.]

Dated 19th October, 1858.

2328. E. Walker, London-street—An improved filter. (A com.)

Dated 27th December, 1858.

2960. J. Davies, Liverpool—An improved portable self gas generating lamp. (A com.)

Dated 14th January, 1859.

123. M. A. F. Mennons, 39, Rue de l'Echiquier, Paris—A new or improved time-measurer. (A com.)

Dated 19th January, 1859.

158. J. Thornton, Cleckheaton, Yorkshire—Imp. in carding engines.

Dated 20th January, 1859.

175. T. Greenwood and J. Batley, Leeds—An imp. in the process of gassing textile fabrics. (A com.)

Dated 4th February, 1859.

314. M. Smith, Sun Foundry, Heywood, Lancashire—Certain imp in looms for weaving.
328. J. Honeyman, Glasgow—Imp. in the construction of ships, vessels, and boats, and in propellers for propelling the same.
330. W. Clark, 53, Chancery-lane—Imp. in the means or apparatus for preserving grain, flour, eggs, and other vegetable and animal substances.

Dated 7th February, 1859.

339. J. Holroyd, Leeds—An imp. in apparatus used in finishing woollen and other cloths.
341. W. H. Crispin, Marsh Gate Lane, Stratford, Essex—An improved atmospheric and hydraulic engine for sailing and steam vessels.
343. J. Lee, 18, Monson-street, Lincoln—Imp. in the manufacture of cranks for steam engines and other purposes.
345. E. T. Hughes, 123, Chancery-lane—Imp. in ovens. (A com.)
347. J. Wilson, 55, John-street, Sunderland—Imp. in ventilating mines, and in combining apparatus used for such purpose.

Dated 8th February, 1859.

349. E. T. Hughes, 123, Chancery-lane—Imp. in machinery or apparatus for sorting and numbering the threads or filaments of silk or other fibrous materials. (A com.)
351. G. Thomas, 47, Hamilton-street, Paddington—A double-bottomed horse-shoe.
355. J. Aspinall, Great Tower-street—An imp. in the refining of sugar.
357. A. Clark, Gate-street, Lincoln's-inn—Imp. in revolving shutters and blinds, and in apparatus connected therewith.
359. T. S. Cressey, High-street, Homerton—Imp. in machinery used in the manufacture of casks.

Dated 9th February, 1859.

361. E. Wilkins, 7, Addington-place, Camberwell-road—Imp. in flower vases.
362. J. S. Joseph, Rhostyllan, near Wrexham, Denbigh, North Wales—Imp. in coke ovens, and in cooling and extinguishing coke.
363. W. Archer, Bolton—Certain imp. in Jacquard machines.
364. H. Jefferies, Birmingham—An imp. in castors.
365. J. Crossley, Halifax—Imp. in the means employed when steaming printed yarns.

366. J. Taylor, Stalybridge, and C. Wild, Oldham—Imp. in self-acting mules for spinning and doubling.
367. J. H. Johnson, 47, Lincoln's-inn-fields—Imp. in fire-arms. (A com.)
369. J. E. McConnell, Wolverton—Imp. in steam boilers and in the generation and treatment of steam.
370. W. E. Newton, 66, Chancery-lane—An improved mode of bleaching and purifying, or refining sugar and vegetable juices or extracts. (A com.)
371. E. Herring, the Heath, Weybridge, Surrey—Imp. in the mashing and fermenting of grain for the production of alcohol.
372. W. E. Newton, 66, Chancery-lane—Certain imp. in breech-loading fire-arms, and in cartridges to be used in such fire-arms. (A com.)

Dated 10*th February*, 1859.

373. H. P. Burt, Charlotte-row, Mansion-house—Imp. in railway carriages and waggons.
374. J. Young, Wolverhampton—An imp. or imps. in the construction of knobs, and the roses used for connecting knobs with doors, and with the cases of locks and latches, and other like fastenings.
375. J. G. Taylor, Paris—Imp. in writing materials, and the manufacture thereof.
377. R. J. Ellis, Liverpool—Imp. in the apparatus for lifting sunken vessels and other submerged bodies.
379. H. Inger, 3, Red Lion-square, Holborn—The imp. of blinkers used by horses whilst drawing, to be called the "Patent Safety Blinker." (A com.)
381. C. L. Perry, Sheepstead Farm, Marcham, Berkshire—An agricultural implement for paring and ploughing land.

Dated 11*th February*, 1859.

382. M. Billing, Birmingham, and W. Kloen, Aston, near Birmingham—A method of, and apparatus for, decolourizing tea.
383. J. Evans, Tarlton-street, Liverpool—An imp. in "Hansom" cabs.
384. J. Parkinson, Manchester—A certain imp. in coffins.
385. N. Bennett, 4, Furnival's-inn—Imp. in the construction of brooms or brushes for sweeping or cleansing streets, roads, and thoroughfares, also applicable to domestic purposes.
387. G. Hyde, 61, Fleet-street—A pen for producing a copy or copies of a letter or other writing simultaneously with the production of the original.
388. R. Cogan, Red Lion-square—Improved instruments for crushing and mixing solid and liquid substances.
389. H. A. Bartlett, Thetford, Suffolk—Imp. in machinery to be used with or without the plough for clearing and cleaning land from weeds.
390. C. Jackson, Store-street, Bedford-square—Imp. in the action of pianofortes.
391. J. Grimes, 6, Osborn-street, Whitechapel—Imp. in beer engines.
392. H. Ransford, West Brompton—An imp. in building ships and other vessels.

Dated 12*th February*, 1859.

393. G. Hadwen, Audenshaw, and J. Wadsworth, Droylsden, Lancashire—Imp. in Jacquard apparatus, applicable to power looms.
394. H. Lea, Birmingham—Imp. in changing or reversing motion.
395. T. Willis and G. Chell, Longsight, near Manchester—Imp. in machinery for spinning, twisting, doubling, and winding yarns and threads.
397. J. Crabtree, Market-street, Bradford—Imp. in the manufacture of bobbins and spools.
398. S. H. Huntly, Upper Baker-street—Imp. in cooking apparatus.
399. T. White and G. Jenkins, Portsmouth—Imp. in apparatus for raising and lowering ships along inclined slips.
400. J. Bennett and J. Bennett, Kingsland-road—An imp. in refrigerators for cooling beer and worts.
401. G. Betjemann, G. W. Betjemann, and J. Betjemann, Upper Ashby-street—Imp. in book slides.
402. W. G. Rawbone, Gloucester street—Imp. in fire-arms and ordnance.
403. G. T. Bousfield, Loughborough-park, Brixton—Imp. in revivifying the scarlet colour of woollen cloth lace and embroidery, in use for military and other garments and furniture. (A com.)
404. H. Gardner, 1, Old Quebec-street, Portman square—Imp. in machinery for breaking and preparing flax and other fibres.
405. R. Bell, Paris—Imp. in separating and recovering wool from fabrics composed of wool, or wool in connection with cotton and other vegetable substances.
406. W. E. Newton, 66, Chancery-lane—Imp. in breech-loading fire-arms. (A com.)
407. W. E. Newton, 66, Chancery-lane—Imp. in sewing machines. (A com.)

Dated 14*th February*, 1859.

408. J. Parkinson, Manchester—Certain imp. in coffins.
409. T. Hunt, Crewe, Chester—Imp. in steam boilers or generators, and in the prevention or combustion of smoke.
410. C. Sanders, Harford-street, Birmingham—Certain imp. in ornamenting English passepartouts for photographic pictures, also the glasses used with the same, and which said modes of ornamenting are also applicable to ornamenting photographic frames generally.
411. J. Wright, New George-street, Sheffield—Imp. in reducing and rolling steel and iron wire, and other forms of those metals in long lengths.
412. J. L. Clark, Haverstock-hill—Imp. in the means of working railway signals and switches.
413. J. Copcutt, 26, Kirby-street, Hatton-garden—Imp. in obtaining light from gases.
414. R. Clegg, Islington, F. Angerstein, Kennington, and J. W. Page, Walworth-road—Imp. in making soap.
415. A. B. Clarke, Edward-street, Blackfriars-road—Imp. in discharging sewage and water from lands into tidal rivers, and in flooding lands therefrom, also conveying sewage and other waters or liquids across canals and over structures, part of such said improvements being applicable as a substitute for sluice cocks and valves.

Dated 15*th February*, 1859.

416. E. H. Aldrich, Shoreditch—Imp. in ladies' dress caps.
418. R. Mushet, Coleford, Gloucestershire—Imp. in the manufacture of steel iron and cast steel.
420. W. Raymond, 4, Albion-square, Dalston—An improved life raft.
422. J. T. Jones, Glasgow—Imp. in sewing machines.

INVENTION WITH COMPLETE SPECIFICATION FILED.

483. W. S. Clark, 76, Cannon-street West—Imp. in the formation of cast iron rails for city railways, and also in the method of uniting the ends of two adjacent rails for railway use. (A com.)—22nd February, 1859.

WEEKLY LIST OF PATENTS SEALED.

[*From Gazette*, *Feb.* 25, 1859.]

February 25*th.*

1942. W. Esson.
1948. J. Fowler, jun., and R. Burton.
1949. R. Knight.
1955. G. Weedon and D. W. Rice.
1959. J. Brazil and J. McKinnell.
1960. G. Davies.
1961. J. Brazil and J. McKinnell.
1963. J. Oxley.
1964. G. Jones.
1965. J. L. Clark, F. Braithwaite, and G. E. Preece.
1966. E. Lindner.
1970. E. Spary.
1976. D. Heyworth and J. Heyworth.
1981. Capt. P. D. Margesson, R.A.
1992. J. Walker and J. Barnes.
1998. J. Robertson.
2008. D. Andrew.
2018. J. Shanks.
2032. W. Parsons.
2034. W. Parsons.
2040. W. Prisley.
2045. T. Timms.
2086. R. Lakin and J. Wain.
2107. J. G. N. Alleyne.
2122. A. V. Newton.
2154. M. A. F. Mennons.
2519. J. Buchanan.
2537. J. Buchanan.
2580. S. Hoga, W. P. Piggott, and S. Beardmore.
2848. W. E. Wiley.
2896. J. Kerr.
2936. J. Whitelaw.
2950. J. H. Johnson.
2969. J. Leck.
2998. J. H. Johnson.

[*From Gazette*, *March* 1, 1859.]

March 1*st.*

1984. W. Hobbs.
1994. J. Bleakley.
1997. J. M. Bellanger.
1999. W. Harkes.
2002. R. A. Brooman.
2005. R. A. Brooman.
2010. H. Hyde.
2014. J. Fielden.
2016. R. A. Brooman.
2020. J. Fyfe.
2024. F. W. Brind.
2082. J. Luis.
2123. J. Dewrance.
2441. N. Brough.
2460. E. Fielding.

PATENTS ON WHICH THE STAMP DUTY OF £50 HAS BEEN PAID.

[*From Gazette*, *Feb.* 25, 1859.]

February 21*st.*

466. T. G. Messenger.
469. J. Warburton.
529. H. A. Dewar.

February 22*nd.*

467. R. B. Jones.
470. H. Loveridge.

February 23*rd.*

460. E. Schischkar.
497. G. T. Bousfield.
505. T. T. Jopling.
509. I. Westhorp.
730. A. Tolhausen.
893. A. V. Newton.

[*From Gazette*, *March* 1, 1859.]

February 25*th.*

492. P. Schafer and F. Schafer.
506. F. P. Walker.

February 26*th.*

512. J. Fowler and D. Greig.
513. E. T. Archer.

LIST OF DESIGNS FOR ARTICLES OF UTILITY REGISTERED.

No. in the Register.	Date of Registration.	Title.	Proprietors' Name.	Address.
4149	January 25.	Glass Bottle	Elias Lyons and Sons	The Peasley Glass Bottle Works, Sutton, St. Helen's
4150	February 9.	Parasol	William and John Sangster	75, Cheapside
4151	„ 14.	A Bolt or Fastener	John Whitehouse and Son	Birchall-street, Birmingham